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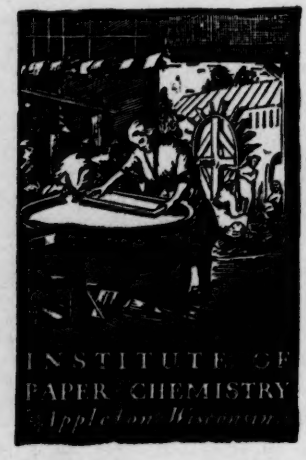
BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

JULY · 1954

Volume 24 Number 11

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THE INSTITUTE OF PAPER CHEMISTRY

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Books and Pamphlets Added to the Library During June

ARCHITECTURAL ACOUSTICS

ACOUSTICAL MATERIALS ASSOCIATION. Sound absorption coefficients of architectural and acoustical materials. Bulletin 14. [New York] The Association, 1953. 20 p.

BIOLOGICAL CHEMISTRY

MINNESOTA. UNIVERSITY. *Department of Agricultural Biochemistry.* Collected research papers, numbers 853-914. Volume 17, 1952-1953. St. Paul, Minnesota Agricultural Experiment Station, 1954. Reprints with various pagings.

CHEMISTRY, INORGANIC

HÜCKEL, WALTER. Structural chemistry of inorganic compounds. Translated by L. H. Long. New York, Elsevier, 1950-51. 2 v. 1094 p.

CHEMISTRY, TECHNICAL

LEWIS, WARREN K., RADASCH, ARTHUR H., and LEWIS, H. CLAY. Industrial stoichiometry; chemical calculations of manufacturing processes. 2d ed. New York, McGraw-Hill Book Co., 1954. 429 p.

CHROMOSOMES

SCHRADER, FRANZ. Mitosis; the movements of chromosomes in cell division. 2d ed. New York, Columbia Univ. Press, 1953. 170 p.

ENGINEERING—BIBLIOGRAPHY

The ENGINEERING INDEX, 1953. New York, Engineering Index [c1954] 1272 p.

HEAT—CONDUCTION

INGERSOLL, LEONARD R., ZOBEL, OTTO J., and INGERSOLL, ALFRED C. Heat conduction with engineering, geological, and other applications. Rev. ed. Madison, Univ. of Wisconsin Press, 1954. 325 p.

HEAT—TRANSMISSION

MCADAMS, WILLIAM H. Heat transmission. 3d ed. New York, McGraw-Hill Book Co., 1954. 532 p.

PAPER MAKING AND TRADE

JAHN, KARL THEODOR. Arbeit an der Papiermaschine; Grundschule für Papiermacher. 3. durchgesehene u. erw. Aufl. Darmstadt, Eduard Roether Verlag, 1954. 317 p.

PAPER SPECIALTIES

KOTTE, HANS. Ein Jahrhundert echt Pergamentpapier. Emmerich am Rhein, Schleipen & Eichhorn [c1954] 158 p.

The PAPER year book, 1954 edition. [12th annual ed.] Anita Reinig, editor. Duluth, Minn., Davidson Publ. Co., c1954. 570 p.

POPLARS

ENTE NAZIONALE PER LA CELLULOSA E PER LA CARTA. *Camera di Commercio di Rovigo.* Atti del Congresso Nazionale del Pioppo (Rovigo 15 novembre 1953). Roma, Ente Nazionale, 1954. 257 p.

PROTEINS

WORMELL, ROBERT LOUIS. New fibres from proteins. New York, Academic Press, 1954. 208 p.

WATER

VOM WASSER. Ein Jahrbuch für Wasserchemie und Wasserreinigungstechnik. Herausgegeben von der Fachgruppe Wasserchemie in der Gesellschaft Deutscher Chemiker. Verantwortlich für den Text: Wilhelm Husmann. Weinheim, Verlag Chemie [c1954] 20. Band 1953. 336 p.

WATER-MARKS

WEISS, WISSO. Thüringer Papiermühlen und ihre Wasserzeichen. Weimar, Thüringer Volksverlag, 1953. 96 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

AIR CONDITIONING

VALENTINE, D. M. Controlled atmospheric conditions standardize laboratory testing at Ohio Boxboard. Paper Ind. 36, no. 3: 291 (June, 1954).

The air-conditioning system for maintaining a constant temperature of 75°F. and a relative humidity of 50 ± 1% at the Rittman, Ohio laboratory of the Ohio Boxboard Co. is described briefly. 1 flowsheet and 1 illustration. E.S.

AIR POLLUTION

MILLER, V. L., ALLMENDINGER, D. F., JOHNSON, FOLKE, and POLLEY, DOROTHY. Lime papers and indicator plants in fluorine air pollution investigations. J. Agr. Food Chem. 1, no. 7: 526-9 (June 24, 1953).

The use of gladiolus plants and lime-treated filter paper (Whatman No. 1 filter paper dipped in lime suspension and dried in an oven at 50°C.) is described as a method of estimating areas where sufficient fluorides are in the air to increase the fluoride content of forage used for cattle pasture. The filter paper may be used on a year-round basis to detect atmospheric fluoride when no vegetation is available for sampling. 4 tables, 5 figures, and 9 references. E.S.

WADE, CHAS. F. Efficient smoke prevention. Paper-Maker (London) 127, no. 5: 392, 394-5 (May, 1954).

The author discusses the causes of true smoke emissions from domestic and industrial chimneys and gives directions for smoke prevention, including the frequent firing to fires which are still brisk with a sufficient amount of heat available to insure immediate ignition of the fresh fuel charges and an adequate supply of correctly applied air. E.S.

ALKALINE PROCESSES

BERGSTRÖM, HILDING. Investigations on by-products from the sulfate process. Svensk Papperstidn. 57, no. 10: 378-80 (May 31, 1954). [In Swedish; English summary]

Brief extracts from more comprehensive investigations on by-products obtained during the cooking of kraft pulp are given, including data on tall oil, phenols, an acid-resistant steel laboratory apparatus for the vacuum distillation of high-boiling oils, and extractives from spruce-, birch-, and aspenwood chips. 1 figure. E.S.

ALKALINE PROCESSES—RECOVERY

STOESS, H. A., JR. Salt cake feeding in chemical recovery unit. Tappi 37, no. 6: 216-17A (June, 1954).

A pneumatic method for conveying the make-up salt cake from the main

storage bin to the mixing tank (eliminating the present service bin, screw feeder, and vibrating screen) in the chemical recovery unit of the kraft process and its advantages are outlined. 2 diagrams. E.S.

ANTIOXIDANTS

TAPPEL, A. L. Expanding uses of antioxidants. Food Eng. 26, no. 6: 73-5, 133-4 (June, 1954).

In a discussion of the uses of antioxidants, information is given on the increase in stability resulting from the addition of an antioxidant mixture in testing lard film on wax paper and paperboard; antioxidant-treated papers are an important development because wrapping papers often contain heavy metal catalysts and they also soak up fat and thus provide a contact between the fat and air. 7 tables, 1 figure, and 13 references. R.A.S.

ASPEN

HAUGBERG, MARTIN. Progeny tests with aspen. Norsk Skogind. 8, no. 5: 180-4 (May, 1954). [In Norwegian; English summary]

The results of Swedish progeny tests with aspen are reviewed which indicate that the hybrid *Populus tremula* × *P. tremuloides* grows considerably quicker than the pure *P. tremula* (I). The first progeny tests with aspen in Norway began in 1948 with Danish plants; two years later two new tests were carried out with Swedish plants. Since then the work has been extended, and new tests have been carried out annually. The results of these tests show a higher rate of survival for the hybrids than in the case of the pure aspen; (I) does not seem to be suitable for Norwegian reforestation projects. In the oldest experiments the best hybrid at eight years of age attained a height of 4.72 m., whereas that of a Norwegian aspen amounted to only 1.92 m. The best growth results of the hybrids in the Norwegian tests are considerably below those obtained in Sweden, for which the poor Norwegian soil used in the experiments is probably responsible; the author does not believe that the hybrid aspen has an inferior chance in Norway. So far, only a small number of hybrid families have been tried, with the (I) material obtained from Denmark and Sweden, whereas the *tremuloides* material came from the eastern districts of North America. It is possible that *P. tremuloides* from the western states would make a valuable contribution to a hybrid suitable for the Norwegian climate. Large variations exist in (I) from different districts; hence, it should be possible to detect a suitable strain. Future work in Norway will deal with the selection of (I) within the range of Norwegian aspen and crossing with *P. tremuloides* from various places in America. 3 tables, 3 figures, and 3 references. E.S.

ASSOCIATIONS

PAXTON, REX. Importance of associations. Paper & Twine J. 28, no. 4: 12, 24-7 (June, 1954).

Regional and national paper trade associations have proved themselves to be of limitless value to companies and individuals by serving as the industry spokesman, a library of vital and essential information, a source of industry statistics, and a liaison with the government. R.A.S.

BAMBOO

DESHPANDE, P. R. Bamboo: an important raw material for the Indian paper industry. Indian Pulp and Paper 8, no. 7: 337-40; no. 8: 377-83 (January, February, 1954).

The author discusses the occurrence of bamboo in southeastern and far-eastern countries, its reproduction and growth, management (rotation and extraction), suitability for pulping, cooking experiments, and the structure of the fibers. 7 tables, 6 figures, and 23 references. E.S.

BARKERS AND BARKING

HARVIN, R. L., and BROWN, W. F. Drum barking of a southern hardwood (turkey oak). Southern Pulp Paper Mfr. 17, no. 6: 56, 58, 60, 62 (June, 1954); *cf.* B.I.P.C. 23: 84-5.

The authors present the results of experimental work on the barking of turkey oak in a mill-size drum barker. Objectives of the work were to determine whether or not the bark could be removed during all seasons of the year using a drum barker and to study the effect of the time of storage on the barking characteristics. It was concluded that no hard and fast rules can be formulated for proper barking of scrub oak and that the degree to which barking must be carried out depends upon the use to which the wood is to be put. It appears that the date of cutting caused greater variations than storage time; one pass was usually not sufficient to remove all the bark. In general, satisfactory barking was obtained in all tests, except in the case of logs cut in winter and stored two or four months. 2 tables and 3 figures. R.A.S.

BEATING

MCNEILL, D. Beating and refining. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 35, no. 1: 129-38 (February, 1954).

The author has been in contact with beating for almost 35 years, most of his time being spent in batch beating with various types of beaters and refiners. He presents a cross section of his accumulated experience, covering hollanders, jordans, and kollergangs, and possible improvements in their operation. E.S.

BIRCH

PERILÄ, OLAVI. The location of the resins, fats, and waxes in the trunk cells of birchwood. Paper and Timber (Finland) 36, no. 4: 213-16 (April, 1954). [In Finnish; English summary]

The resins, fats, and waxes of cross sections of birchwood were colored as one group with the dyestuff Sudan III. Two photomicrographs are reproduced which show that the extractives are concentrated in the medullary rays, the walls and partition walls of the vessels, and in the middle lamellas of the libriform cells; the medullary spots are strongly colored. The acidic resins, fats, and waxes, and the proteins were colored with oxazine (the reduced form of the dyestuff Nile blue), using a 0.02% solution of Nile blue in water. Four photomicrographs of cross sections and one of a tangential section of birchwood indicate that the acidic extractives are located principally in the middle lamellas of all cells and in some cases also on the inner cell walls. The neutral resins, fats, and waxes were stained with oxazone (the oxidized form of Nile blue), using both a 1% solution of Nile blue in water and oxazone which had been separated from Nile blue by extraction with ether and then dissolved in alcohol. Three photomicrographs of sections stained according to the former, and one section prepared by the latter method are included, which illustrate that the neutral extractives are located principally on the inner walls of the medullary ray cells and in the partition walls of the vessels. 11 photomicrographs and 5 references. E.S.

BLEACHING

CANADIAN PULP AND PAPER ASSOCIATION. *Technical Section. Engineering Data Sheet Committee.* Bleach liquors; Baumé strength of soda and lime bleaches. Pulp Paper Mag. Can. 55, no. 6: 108 (May, 1954).

A chart is presented (Data sheet E-3, issued November, 1953) for conversion of specific gravity in degrees Bé. of sodium and calcium hypochlorite bleach liquors to available chlorine in grams/liter. W.B.W.

BLEACHING—SULFATE

AITKEN, KENNETH G. Peroxide bleaching of sulphate pulp; laboratory developments related to mill application. Pulp Paper Mag. Can. 55, no. 6: 125-30 (May, 1954).

The author describes the bleaching of sulfate pulps through the addition of sodium peroxide in the final alkaline extraction stage. Methods of preparing the peroxide solution, variables associated with this method of bleaching, and results obtained on a laboratory scale, are outlined. The conclusion reached is that sulfate pulps can be bleached to brightnesses of 85-90 through the use of sodium peroxide while retaining the same strength obtained with normal bleaching agents at much lower brightnesses. 9 tables and 5 figures. E.S.

BOARD—CONVERSION

TURNER, JOHN S. Paper box manufacturers among our industry's top customers. Pulp Paper Mag. Can. 55, no. 6: 96-100 (May, 1954).

Canadian paper box manufacturers purchased 34.2 million dollars' worth of paper and board for conversion in 1952; the conversion processes of a folding box plant (Premier Paper Box Ltd., Montreal) and a setup box plant (division of Standard Paper Box Mfg. Ltd., Montreal) are described. 1 table and 8 illustrations. R.A.S.

BOARD—DRAWING PROCESS

HÖRTH, OTTO. The drawing properties of raw and coated boards. Wochbl. Papierfabrik. 82, no. 9: 311-14 (May 15, 1954). [In German]

The drawing process in a press between heated dies requires special properties of the board; hence the suitability of board for drawing purposes should be emphasized when placing an order. The influence of the following factors was studied: type and moisture content of board, drawing temperature, and pressure. Raw (I) and coated (II) chromo imitation boards were tested. The principal conclusions of this study are: Moisture content of the boards and drawing temperature were found to be the most influential factors. Below 6% moisture, boards cannot be drawn without cracking; the higher the moisture content, the lower the required temperature at which the boards can be drawn successfully. The lower the moisture content, the higher will be the temperature at which blistering occurs. Blistering often took place close to the temperature of satisfactory drawing, particularly in (II); the latter must be drawn at much lower temperatures than those permissible for (I). The optimum pressure during drawing must be determined experimentally. 4 tables and 3 figures. L.E.W.

BOARD, CORRUGATED

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. *Corrugated Container Committee.* Corrugated containers sessions papers. Tappi 37, no. 6: 162-215A (June, 1954); Fibre Containers 39, no. 3: 64-6, 68-70, 72-3, 76-91 (March, 1954). [Second reference contains abridgments]

The program consisted of four sections, dealing with the easy opening box, high-humidity containers, heat balance and its effect on corrugated board, and general. The following papers, listed by authors and titles, were presented: *The easy opening box.* Lowery, Foster. Application of gummed tear tape on the semiautomatic taping machine. Tappi, p. 162-3A; Fibre Containers, p. 64; Paul, Lee. Pressure-sensitive tear tape application. Tappi, p. 163-4A; Fibre Containers, p. 66; Friedman, Walter. The properties, problems, and performance of gummed tear tape. Tappi, p. 164-6A; Fibre Containers, p. 64-6; discussion: Tappi, p. 166-7A. *High humidity containers.* Gardner, H. S., Martin, G. E., Wanamaker, O. P., and Kane, D. E. Reinforced corrugating media in high humidity containers. Tappi, p. 168-70A; Fibre Containers, p. 66, 68-70—5 figures and 2 references in the first and 4 figures in the second reference; Fletcher, Claude H. Starch adhesives in sulphur treated corrugating medium. Tappi, p. 170-1A; Fibre Containers, p. 70; Sederlund, W. W. Case sealing adhesives for high humidity container storage. Tappi, p. 171-3A; Fibre Containers, p. 70, 72-3; Zusi, Charles J. Laboratory testing of effect of high humidity on containers. Tappi, p. 173-4A; Fibre Containers, p. 73, 76; discussion: Tappi, p. 174-5A; Fibre Containers, p. 76-8. *Heat balance and its effect on corrugated board.* Lundrigan, R. J. Modern condensate drainage control for corrugators. Tappi, p. 175-7A—3 figures; Fibre Containers, p. 78-80; Vander Meulen, C. R. The detrimental effect of either excessive or insufficient heat on corrugating board starch. Tappi, p. 177-9A—3 references; Fibre Containers, p. 80-1; Nitchie, Charles D. Conventional steam trap systems. Tappi, p. 179-81A; Fibre Containers, p. 81-3; Swaney, R. Casper. Heating with hot oil. Tappi, p. 181-3A; Fibre Containers, p. 83-4; Kreyling, R. L. Thermal balance with silicate adhesives. Tappi, p. 183-4A; Fibre Containers, p. 84; Harrison, Paul. The role of the steam system in corrugating. Tappi, p. 184-8A; Fibre Containers, p. 84-5; discussion: Tappi, p. 188A; Fibre Containers, p. 85-6. *General session.* Long, F. D. TAPPI corrugating waste survey. Tappi, p. 188-91A; Fibre Containers, p. 86-8—3 tables in both; Carlisle, L. O. The importance of viscosity control. Tappi, p. 191-3A; Fibre Containers, p. 88-9; Candell, Earl B. Quality specifications of corrugated board from a consumer's viewpoint. Tappi, p. 193-6A; Fibre Containers, p. 89-91—3 figures in the first and 2 in the second reference (*cf.* B.I.P.C. 24: 479); and Schoenberg, William. The effect of moisture variation upon standard corrugated test procedures. Parts I and II. Tappi, p. 196-215A—10 tables, 39 figures, and 1 reference; Fibre Containers, p. 89; discussion: Tappi, p. 215A; Fibre Containers, p. 91. E.S.

BOARD MILLS

ANON. How Springfield kraft mill carried out expansion. Pulp & Paper 28, no. 6: 84, 86, 88 (June, 1954); *cf.* B.I.P.C. 20: 234-5.

The recent expansion of the Springfield, Ore. Pulp Division of Weyerhaeuser Timber Co. increased kraft containerboard production from 250 tons to 350 tons/day. The project included a major enlargement of the Rice Barton machine (from 103-134 ft. in wire length), the machine room, addition of two digesters, a second lime kiln, another Chicago Bridge blowtank and Fibre Making Processes blow steam heat recovery system, chip storage,

Hydraulic Supply Co. evaporators, an Impco high-density stock storage system, a doubling of salt cake storage, three new E. D. Jones Majestic jordans, and a Dilts Hydrafiner. 7 illustrations. R.A.S.

ANON. Manchester's new Seaboard mill equipped by Black-Clawson Co. Paper Mill News 77, no. 21: 18-22 (May 22, 1954); *cf.* B.I.P.C. 24: 701.

The installations in the new boxboard mill at Richmond, Va. are described in a series of 19 illustrations with appropriate captions. E.S.

ANON. Marathon expansion at Oswego. Fibre Containers 39, no. 5: 94, 96 (May, 1954).

The expansion of the Marathon Corp. mill at Oswego, N.Y. will provide the corporation with a fourth carton-converting plant. The first step in the program, which was completed in January, 1954, was the renovation of the former machine building and the installation of Miehle cutters and creasers and machinery for waxing, folding, and gluing cartons; future plans include a pressroom, all-weather ramp, liquid wax storage house, ash collector, coal hopper shed, and warehouse. 7 illustrations. R.A.S.

ANON. Michigan hardwoods + new process solve dilemma for American Box. Pulp & Paper 28, no. 6: 70-4, 76-8, 80, 82 (June, 1954); Paper Ind. 36, no. 3: 284-7 (June, 1954); *cf.* B.I.P.C. 24: 607, 700.

A detailed description of the Filer City, Mich. mill of American Box Board Co., producers of ninepoint corrugating medium from aspen chips, is presented. The two references are not identical. 2 flowsheets and 18 illustrations in the first and 1 table and 7 illustrations in the second reference. R.A.S.

ANON. Southern Paperboard completes high yield expansion. Paper Trade J. 138, no. 25: 30, 32-3 (June 18, 1954).

The high-yield expansion program of the Southern Paperboard Corp., Port Wentworth, Ga. is described; the additional facilities will increase production from 450 tons to a maximum daily capacity of 685 tons of finished board. Four carbon-steel Chicago Bridge & Iron Co. digesters, three Oliver United vacuum washers, and a six-effect General American evaporator unit were added; improvements were also made in the board machine and power plant. 4 illustrations. R.A.S.

ROOT, EDWARD M. Manchester Board and Paper Company starts new Seaboard Division paperboard plants. Southern Pulp Paper Mfr. 17, no. 5: 30, 32, 34, 36, 38, 41-2 (May, 1954); *cf.* B.I.P.C. 24: 701.

A description of the new boxboard mill at Richmond, Va. similar to that in the previous reference is given. 20 illustrations. E.S.

BOARD MILLS—WASTE LIQUOR

ANON. New waste recovery in Michigan mill. Pulp & Paper 28, no. 5: 70, 72 (May, 1954).

The installation of a Bulkley-Dunton Colloidair system (a dissolved-air flotation method for cleaning up effluent) at the Rocky River Paper Mills on the St. Joseph River, Mich. (making 50 tons of bristols, folding boxboards

for the frozen-food industry, and colored specialties/24 hours) reduced fiber loss to 41 pounds/day or 0.054% of production. A brief description of the system and its mode of operation is given; other new equipment added to the mill is listed. 1 table and 2 figures. E.S.

BOARD SPECIALTIES

ANON. The carry-carton spreads out. Modern Packaging 27, no. 10: 93-8, 200 (June, 1954).

The use of carrier cartons is no longer restricted to beer and soft drinks, but multiple-unit vehicles have become successful in selling dog food, fruit juices, canned milk, motor oil, household cleansers, and an ever-increasing number of other products. The principles of multiple sales, types of carriers, economics of handling, and best applications are discussed. 20 illustrations. R.A.S.

BUYING

BECKETT, W. R. Management and the purchasing department—their relationship today. Pulp Paper Mag. Can. 55, no. 6: 102-4 (May, 1954).

The job of a purchasing agent in a paper mill is outlined; information of this department frequently provides assistance to management officials, e.g., the treasurer can be informed whether a purchase is a capital investment or an item of expense, advice can be given to higher management when large requests are referred, and the purchasing department attends to routine matters of special purchases made by officers. R.A.S.

CELLULOSE

CENTOLA, GERMANO. Irregularities in the constitution of cellulose. Industria carta (Milan) 8, no. 1: 1-2 (January, 1954). [In Italian; French, English, and German summaries]

The chromatographic analysis of sugars obtained by total hydrolysis of the molecular fractions of different cellulosic pulps showed that it is impossible to separate a pure polymer from glucose, even in the case of highly purified celluloses. This fact leads the author to the assumption that a certain percentage of the sugars present in the hemicelluloses of wood, notably xylose and mannose, participate with glucose in the formation of cellulosic macromolecules. 4 tables and 9 references. E.S.

CELLULOSE—HEMICELLULOSE

BINGER, HERMAN P., SULLIVAN, JOSEPH T., and JENSEN, CLIFFORD O. Forage crop constituents; the isolation and analysis of hemicelluloses from orchard grass. J. Agr. Food Chem. 2, no. 13: 696-700 (June 23, 1954).

Polyuronide hemicelluloses, isolated from orchard grass (*Dactylis glomerata* L.), comprise up to 20% of the dry weight. Holocellulose was prepared by treatment of the fat- and pectin-free grass with sodium chlorite and this was extracted successively with hot water, 0.5% potassium hydroxide, and 1.5% potassium hydroxide. Hemicelluloses were obtained from these extracts as precipitates upon acidification, addition of alcohol, and finally by evaporation of the alcoholic solution. These precipitates were hydrolyzed to yield reducing sugars which were separated by paper chromatography and estimated by electron reflection densitometry. Xylose, glucose, arabinose, galactose, and uronic acids were found in almost all hemicellulose fractions,

with the first two sugars comprising the major portion of the carbohydrates. Over 70% of all hemicelluloses obtained were from the water extraction of the holocellulose, and these contained lower percentages of pentose than those which were alkali-extracted. 5 tables, 1 flowsheet, and 29 references. E.S.

SAARNIO, JOUKO, WATHÉN, KRISTINA, and GUSTAFSSON, CHARLEY. Uronic acids in wood pulp. Paper and Timber (Finland) 36, no. 4: 209-12 (April, 1954). [In English]

Sulfite and sulfate pulps of spruce-, pine-, birch-, and aspenwood were subjected to a mild hydrolysis, and the hydrolyzates were tested chromatographically. The pentosan content and the total amount of uronic acids in the pulp samples were investigated; a comparison of the results is presented in tabular form. The data indicate that the acidic hemicelluloses which contain uronic acids are completely dissolved from spruce- and pinewood in the sulfate cook, and only neutral hemicelluloses remain in the pulp. However, during sulfite cooking of the four species investigated and in the sulfate cooking of birch- and aspenwood, part of the acidic hemicelluloses of the wood remains in the pulp. The dominating acidic hemicellulose of these pulps is an acidic xylan built up from about 20 xylose units and one 4-methylglucuronic acid unit per molecule, derived from the wood. This xylan is split into xylose and 4-*O*-methylglucosiduronoxylose (*cf.* B.I.P.C. 23: 10, 163) when the pulp is subjected to acid hydrolysis. The presence of acidic xylan even in bleached and alkali-treated sulfite pulp indicates that at least some of the carboxyl groups in this kind of pulp have their origin in the wood and are not formed by oxidation of carbohydrates. The properties of the different types of pulp and some difficulties in their analysis are discussed in the light of the results obtained. 1 table and 12 references. E.S.

CELLULOSE—HYDROCELLULOSE

RICHTZENHAIN, HERMANN, LINDGREN, BENGT O., ABRAHAMSSON, BIRGITTA, and HOLMBERG, KERSTIN. The alkaline degradation of polysaccharides. I. The degradation of cotton hydrocellulose. Svensk Papperstidn. 57, no. 10: 363-6 (May 31, 1954). [In German; English and Swedish summaries]

The alkaline degradation of cotton hydrocellulose of different D.P.'s with 0.5 *N* sodium hydroxide at 100°C. has been studied. The significance of the aldehydic end groups in the degradation of polysaccharides is shown by their reduction with sodium borohydride, whereby the material is stabilized against alkali. It may be assumed that only the material in the lesser ordered ranges and on the surface of the ordered ranges can be degraded by alkali. The alkali-stable fraction of the limit hydrocellulose (about 45%) has about the same x-ray diagram and distribution curve as the initial hydrocellulose. After reprecipitation of this fraction with cuprammonium hydroxide or alkali, the greater part of it is still stable against alkali; however, after a renewed acid hydrolysis it is degraded by alkali. 2 tables, 5 figures, and 19 references. E.S.

CELLULOSE—ION EXCHANGE

ANT-WUORINEN, OLLI. Studies on the liberation of carboxyl groups of cellulose through electrodialysis. Paper and Timber (Finland) 36, no. 4a: 141-2, 144-8 (Special issue, April, 1954). [In English] *cf.* B.I.P.C. 22: 816-17.

The purpose of the present investigation was the determination of the

circumstances and the extent to which carboxyl groups of cellulose can be liberated by electrodialysis. The cellulose samples were electrodialyzed in: (*a*) the natural state, (*b*) after liberation of the carboxyl groups by carbon dioxide-saturated water (I), and (*c*) after liberation of the carboxyls by (I) and subsequent blocking with sodium hydroxide solution. The experiments were carried out with free access of air and in a nitrogen atmosphere; the water in the electrode chambers was either changed twice a day or renewed continuously. The results of the different experiments are given in tables and graphs; the apparatus used is described in detail. The results indicate that the total amount of the carboxyl groups cannot be liberated in a carbon dioxide-free electrodialysis system; this is only possible when the system is in contact with the carbon dioxide of the air. This indicates that it is actually the very weak acidity of distilled water—when in equilibrium with the atmosphere—which liberates the carboxyl groups. The electric current removes only the cations. The procedure is very slow—taking several days, whereas the liberation by means of (I) takes only a few hours (*cf.* B.I.P.C. 21: 769-70). 8 tables, 11 figures, and 13 references. E.S.

CELLULOSE—SOLUBILITY

JAYME, G., and VERBURG, W. A new alkaline solvent for cellulose: the system cellulose-ferric hydroxide-tartaric acid-sodium hydroxide. Reyon, Zellwolle u. Chemiefasern 32, no. 4: 193-9; no. 5: 275-9 (April, May, 1954). [In German]

Cellulose (highly reactive 90% alpha dissolving pulp) dissolves up to 7.5% in solutions containing 350 grams/liter of an iron-sodium tartrate complex (5.5-8% ferric hydroxide, 39-46% tartaric acid, and 48-56% sodium hydroxide). This corresponds to the complex $(C_4H_3O_6)_3Fe \cdot Na_6$ plus sufficient extra sodium hydroxide to give 2 *N*-3 *N* solutions. The action on cellulose appears similar to that of sodium zincate. Linters also dissolve, but complete homogeneous solution is more difficult. The solutions are highly viscous stable gels. The color ranges from green at the 6% ferric hydroxide level through yellow and orange to reddish brown as the iron content increases. The cellulose can be regenerated to films and fibers on acidification. The substitution of ammonium, potassium, or lithium for sodium prevented solution, as also did the substitution of glycerin, malic acid, oxalic acid, lactic acid, glycolic acid, citric acid, or salicylic acid for tartaric acid. 8 tables, 5 figures, and 7 references. K.W.,Jr.

CELLULOSE, BACTERIAL

BARCLAY, K. S., BOURNE, E. J., STACEY, M., and WEBB, M. Structural studies of the cellulose synthesised by *Acetobacter acetigenum*. J. Chem. Soc.: 1501-5 (May, 1954).

The nitrogen-free polysaccharide synthesized from D-glucose by cultures of *Acetobacter acetigenum* (T. K. Walker's strain) has been proved to be a cellulose, in agreement with Kaushal and Walker (*cf.* B.I.P.C. 21: 688). Methylation and end-group assay revealed the average chain length of its trimethyl ether to be of the order of 600 glucose units. The relative merits of the Barnett and the acetic acid-trifluoroacetic anhydride method of acetylation have been compared. Membranes produced by resting cells of the organism from D-glucose and from D-mannose have been shown to contain only D-glucose residues in the polysaccharide component. 1 table. E.S.

CELLULOSE ESTERS

KEIRSTEAD, KARL, and MYERS, JOHN. A study of the sulphate

ester of unstabilized cellulose acetate. Can. J. Chem. 32, no. 6: 566-80 (June, 1954); *cf.* B.I.P.C. 18: 152-3.

Evidence for the existence of the ester form of the sulfate in unstabilized cellulose acetate has been examined by ion-exchange studies on precipitated and fibrous cellulose acetate. The equilibrium reached during ion exchange is affected by the pH and by the concentration of the salt solution used. The thermal stability of the ester is shown to vary inversely with the sulfate content. A study has been made of the accuracy of the various analyses involved. 8 tables, 4 diagrams, and 15 references. E.S.

STEINMANN, H. W., and WHITE, B. B. Mannan in purified wood pulp and its relation to cellulose acetate properties. Tappi 37, no. 6: 225-32 (June, 1954).

An attempt has been made to determine the causes of the extremely high viscosities obtained in concentrated acetone solutions, using cellulose acetates prepared from varying samples of purified wood pulp. It was postulated that this behavior could be associated with the hemicellulose content of the wood pulps, specifically with their mannan content. An effort was therefore made to characterize the pulps by means of the rate of reaction with lead tetraacetate in acetic acid solution since this is believed to be primarily a reaction with mannan in the initial stages. A good correlation of the lead tetraacetate consumption of wood pulps, as obtained by the extrapolation of the rate curves, was found to exist with the viscosity ratio of the cellulose acetates prepared from them. A correlation with pentosan content was also obtained. However, analysis of the hydrolyzate from the cellulose acetate itself showed the mannan content of the acetate to correlate with viscosity ratio, whereas the pentosan content did not. Presumably more pentosans than mannans are removed during the acetylation process. Using the Ohlsson method of analysis (*cf.* B.I.P.C. 22: 818-19) to determine the amount of gamma fraction in the wood pulp, a good correlation was obtained between the gamma content and the mannan content of the pulps and also between gamma content and viscosity ratio of the corresponding cellulose acetate. Whereas the evidence leads to the conclusion that mannan in wood pulp is the principal source of anomalous viscosity behavior of cellulose acetate prepared from it, the fundamental basis for this relationship has not been explained. 7 tables, 12 diagrams, and 13 references. E.S.

CELLULOSE ESTERS—NITROCELLULOSE

MATHIEU, M. The reactivity of cellulose in relation to its "true" structure. Assoc. tech. ind. papetière, Bull. no. 2: 63-74; no. 3: 100-10 (1954). [In French]

The author gives a resume dealing with the nitration of cellulose with nitrogen pentoxide and with nitric and sulfuric acid, the gelatinization of nitrocelluloses by means of alkyl nitrates, various esters, camphor, and with substituted ureas, studies on the densities of nitrocellulose gels (in the presence of the gelatinizing agents), microcalorimetric determinations of gelatinized nitrocelluloses, and the cellulose-water system. 2 tables, 42 figures, and 26 references. L.E.W.

CHEMICAL TESTING—PULP—ACID NUMBER

SIHTOLA, HANNES. On the acidic character of cellulose. II. The acidity of carboxyl groups in cellulose. Paper and Timber (Finland) 36, no. 4a: 149-50, 152-4 (Special issue, April, 1954). [In English] *cf.* B.I.P.C. 22: 569-70.

A potentiometric method has been developed for the separate determination of the ionizable carboxyls in cellulose. The experiments show that the carboxyls of cellulose samples prepared by different oxidizing agents are not ionized to the same degree. Using nitrogen dioxide and periodic acid as oxidizing agents, series of samples were prepared from sulfite pulp and cotton, in which the carboxyls are formed either at the carbon atom 6 or at the carbon atoms 2 and 3 of the glucose units. The measurements indicate that oxidation with nitrogen dioxide gives the most ionized carboxyls. Wood cellulose seems to behave differently during oxidation than cotton cellulose, giving less clear results. 5 figures and 16 references. E.S.

CHEMICAL TESTING—SULFITE WASTE LIQUOR

KLEINERT, THEODOR N., and WINCOR, WILHELM. The determination of the degree of river pollution by spent sulfite liquor. Das Papier 8, no. 11/12: 214-18 (June, 1954). [In German; English and French summaries]

Following a critical evaluation of some of the common methods for estimating the degree of water pollution by spent sulfite liquors, the authors advocate the use of a rapid characterization of polluted waters by the colorimetric determination of lignosulfonic acids with tyrosine (*cf.* B.I.P.C. 23: 546-7) and the determination of the total B.O.D. by wet combustion with dichromate-sulfuric acid. The above methods were tested with sugar-free lignosulfonic acids isolated from spent beech and spruce sulfite liquors and several typical carbohydrates usually present in the spent liquor and were found suitable for the purpose. In practical applications, the values of the river above and below a polluting mill obtained with these methods should be compared; a necessary prerequisite is the taking of a sufficient number of river-water samples to obtain true average values. The authors also experimented with Fairbairn's modified anthrone reagent (Chemistry & Industry no. 4: 86 [1953]) for establishing its suitability for the determination of the total sugar in spent sulfite liquor; although the studies are still being continued, the available results indicate that the use of anthrone permits a rapid estimation of the amount of sugar present, but does not give precise values. 2 tables, 2 diagrams, and 27 footnotes. E.S.

CHEMICALS

INDUSTRIAL AND ENGINEERING CHEMISTRY. Facts and figures for the chemical process industries. Ind. Eng. Chem. 46, no. 6: 1081-144 (June, 1954); *cf.* B.I.P.C. 22: 819-20.

The fourth biennial report on the industries consists of the following sections, listed by authors and titles: Crass, Maurice F., Jr. Phenomenal growth leveling off, steady future growth seen, p. 1081-6; Bohmfalk, John F., Jr., and Crowe, James M. Progress, expansion, competition, p. 1087-93; Anon. 100 chemical process companies; an analysis of their financial records—1939, 1951, 1952, 1953, p. 1094-108; McGann, Paul W. U. S. mineral production at new high, p. 1109-14; Talbot, Frank. Present capacity meets needs . . . future growth seen, p. 1115-22; Hibben, J. H. Leveling off follows 1951 peak and 1952 decline, p. 1123-30; Stenerson, Harry. Sales continue rapid gains, p. 1131-4; Anderson, Karl L., and Blackwell, Carl P. Competition returns—U. S. trade levels off, p. 1135-8; and Gibbs, Robert G. Manpower supply down, military and industrial demand high, p. 1139-44. Numerous tables and graphs in all articles. R.A.S.

CHEMIGROUNDWOOD PROCESS

O'NEIL, F. W. Chemigroundwood—your hardwood mechanical

pulp. Southern Pulp Paper Mfr. 17, no. 5: 88, 90-2, 94 (May, 1954); *cf.* B.I.P.C. 20: 635-6.

An account is given of the equipment used in the Chemigroundwood process, experiments conducted with northern hardwoods (beech, birch, maple, and aspen), the strength properties of pulps from two of these species (aspen, a low-density, and birch, a high-density hardwood), the economic advantages of the process, and end uses of Chemigroundwood pulps. A cost estimate for chemicals, wood, and process costs (exclusive of equipment and amortization) is included; the total amounts to $39.07/ton of pulp. 9 tables. E.S.

CHLORINE

HOLM, A. C. Ontario's electroproducts industries. Can. Chem. Processing 38, no. 5: 72, 74, 76, 78, 80 (May, 1954).

One section of this review lists the producers of chlorine and caustic soda in the province; seven of the 10 Canadian producers are located in Ontario, and four of the seven are operated by pulp and paper mills. E.S.

CHROMATOGRAPHY

LESTRANGE, RAYMOND J., and MÜLLER, RALPH H. Circular filter paper chromatography. Anal. Chem. 26, no. 6: 953-9 (June, 1954); *cf.* B.I.P.C. 21: 542.

This article is a continuation of the study of the flow of liquids through paper. Data obtained using filter paper squares show the effect of various factors on the rate of solvent flow and the degree of resolution of a known cation mixture. The advantages of the circular technique over the strip method are discussed. 11 tables, 5 figures, and 17 references. E.S.

DEAERATION

DEZURIK, DAVID. The problem of entrained air in paper machine furnish. Paper Mill News 77, no. 24: 90 (June 12, 1954).

An inexpensive stock-flow system which is always full of stock and thereby eliminates the usual points of air pickup is described. 1 diagram. E.S.

DIGESTERS

BRODDNER, MALCOLM. Notes on the brick lining in sulfite digesters. Svensk Papperstidn. 57, no. 10: 369-70 (May 31, 1954). [In Swedish]

The author selects a lining consisting of a 12-mm. layer of mortar, a ceramic-brick lining 40 mm. in thickness, another 10-mm. lining of mortar, and a carbon-brick lining 40 mm. in thickness to explain the differences in expansion between digester shell and lining and the resulting stresses which may occur on heating to about 145°C. To counteract such stresses the ceramic bricks must have swelling properties; the porosity and alkalinity of the mortar must be so balanced that the acid does not penetrate to the iron shell but is neutralized and rendered harmless. The ceramic-brick lining should be considered only as an acid-resistant protection for the iron shell and should be constructed with this purpose in mind. The carbon bricks must be resistant to direct contact with the cooking acid and not become loose with temperature variations. Their principal function is to act as a heat buffer for the layer underneath and to protect it from direct contact with the acid. 3 diagrams. E.S.

DISINFECTION AND DISINFECTANTS

GUSTAFSSON, CHARLEY, and GADD, OTTO. Formalin for prevention of rot and mould growth in wet pulp. Paper and Timber (Finland) 36, no. 4a: 155-6 (Special number, April, 1954). [In English]

The use of a formalin solution (40% formaldehyde) for preventing fungal growth in bales of wet chemical and mechanical pulp was investigated. The results indicate that the addition of about 3000 grams of formalin/ton of pulp gives satisfactory protection against fungal attack for from three to over eight months, the time depending on storage temperature. Although formalin does not afford the same protection at higher temperatures as phenylmercuric acetate, the low toxicity of formalin offers big advantages for sterilizing pulp to be manufactured into foodstuff wrappers. 2 tables. E.S.

SHEMA, B. F., and CONKEY, J. H. Relative toxicity of disinfectants available for use in the pulp and paper industry—1954 supplement. New York, American Paper and Pulp Association, Biological Control Committee, 1954. 6 p. *cf.* B.I.P.C. 23: 880.

The first supplement to the study on the toxicity of materials for use in the pulp and paper industry contains data on the relative toxicity to the same four test organisms of 16 materials which may prove to be effective in the control of objectionable forms of micro-organisms in pulp and paper mill systems, on papermaker's woolen felts, and on the finished product. 2 tables and 1 reference. R.A.S.

DYES AND DYEING

PARROTT, F., and GRUNDY, K. W. Some aspects of the application of dyes to paper. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 35, no. 1: 15-26; discussion: 27-30 (February, 1954).

The authors discuss paper dyeing from the papermaker's or user's angle, with particular reference to beater dyeing with synthetic dyes. The latter are grouped as direct, acid, and basic, and each is discussed for application to the various papermaking furnishes. The selection of the best dye under particular circumstances depends principally upon the type of pattern to be matched and the purpose of the dyed paper; this involves fastness to light, alkalies, acids, etc. The kind of light in which colors are viewed, the dyed material, the dyes used, and the color sensitivity of the eye are all interdependent and important factors in the coloring of paper. Practical details of dye evaluation in the laboratory leading to the preparation of dye recipes for transference to the mill are given. A brief description of color measurement is included; suggestions are made for the use of color-measuring instruments in the paper industry, and their limitations are indicated. Dyeing techniques are outlined, with particular reference to the mixing of different classes of dyestuffs, dye solubilities, and matching to shade. Variations in shade during a run and their causes are discussed, and suggestions for controlling them are made. 7 references. E.S.

ENZYMES

ANON. Target: pure enzymes at a price. Chem. Week 74, no. 25: 66 (June 19, 1954).

The market potential of reasonably pure quantities of cellulase (I) and

hemicellulase (II) (cellulose-hydrolyzing enzymes) in the pulp and paper industry, in the manufacture of textiles, surgical gauzes, cattle feed, conversion of wood and agricultural wastes to glucose, and similar applications is discussed. Commercial production of (I) is at present virtually nonexistent. The only available product is Rohm & Haas' Enzyme 79 which, in addition to (I) and (II), also contains other enzymes (maltase, gumase, cellobiase, and pentosanase) and is only produced on a custom basis, hence is not continually available. Diehm also assigned U. S. patent 2,280,307 (April 21, 1942) to Rohm & Haas, covering a process for improving the quality of straw, mechanical, kraft, or sulfite pulps by adding enzymes (cytase) which solubilize the hemicelluloses and are then removed by washing. The problems connected with the separation of pure (I) and the work of Whitaker of the National Research Council of Canada with the mold *Myrothecium verrucaria* are mentioned. 1 illustration. E.S.

KITTS, WARREN D., and UNDERKOFLER, LELAND A. Digestion by rumen microorganisms; hydrolytic products of cellulose and the cellulolytic enzymes. J. Agr. Food Chem. 2, no. 12: 639-45 (June 9, 1954).

The chemistry of cellulose digestion by rumen micro-organisms was investigated with special reference to identification of the carbohydrates formed and the cellulolytic enzymes. In order to identify the carbohydrate intermediates, a number of organic and inorganic compounds were tested for their ability to arrest fermentation by rumen micro-organisms at the reducing sugar stage. Among those found effective were toluene, thymol, and sodium fluoride. Inhibited cellulose-digesting cultures were prepared and the media analyzed at hourly intervals for the carbohydrate intermediates formed. Filter paper chromatography revealed the principal intermediate compound of cellulose degradation by rumen organisms to be glucose. The cellulolytic enzymes of rumen micro-organisms are not present as such in rumen fluid, but are associated with the bacterial cells, since centrifuged and filtered rumen fluid failed to digest cellulose. Cell-free enzyme extracts of mixed rumen culture and of an isolated rumen organism were prepared which degraded cellulosic substrates. An optimum temperature of 40°C. and an optimum pH of 5.5 were found for the maximum activity of the cell-free preparations. The cell-free preparations are stable at low temperature, but are partially inactivated when allowed to stand at room temperature for 144 hours. 6 tables, 6 figures, and 26 references. E.S.

FEED WATER

AMERICAN CHEMICAL SOCIETY. *Division of Water, Sewage, and Sanitation Chemistry* and *Joint Research Committee on Boiler Feedwater Studies.* Boiler water chemistry. Ind. Eng. Chem. 46, no. 5: 953-97 (May, 1954).

The papers presented at the symposium on boiler-water chemistry at the 124th meeting of the society in Chicago are given; they are listed by authors and titles: Welder, B. Q., and Partridge, Everett P. Practical performance of water-conditioning gadgets—1 table and 106 references, p. 954-60; Neat, F. U., and Berk, A. A. Analysis of water-formed deposits—1 figure and 12 references, p. 961-70; Phillips, J. H., and Stoffer, K. G. Scheme for analysis of industrial water—12 figures and 4 references, p. 970-4; Ulmer, R. C. Significance and application of water analysis data—3 tables, 7 figures, and 7 references, p. 975-8; Clarke, Frank E., and Hopkins, Robert D. Significance of boiler deposit analysis—2 tables and 13 figures, p. 979-82; Maloney, J. M. Internal cleaning of boilers, p. 983-4; discussion:

984-5; Applebaum, S. B. Preparation of feed water make-up—5 tables, 4 diagrams, and 4 references, p. 985-8; discussion: 988; Jacklin, C. Deposits in boilers—2 figures, p. 989-90; Andres, R. F. Corrosion in the boiler—14 references, p. 990-2; discussion: 992; Denman, W. L. Foaming in boilers, p. 992-4; discussion: 994; Maguire, J. J. After boiler corrosion—1 table and 2 figures, p. 994-6; discussion: 996-7; and Partridge, Everett P. Joint Research Committee on Boiler Feed Water Studies, p. 997. R.A.S.

FIBERS

HAARER, A. E. An old and a new fibre. Paper Making 73, no. 1: i-iii (Spring, 1954).

Two West African species, *Sanseveiria trifasciata* and *S. guineensis* are being grown in the southern states of the United States and Mexico in an attempt to find a fiber plant whose production can be completely mechanized. It takes four years to mature a thick stand of tall leaf sufficient for the first crop, but the field will give an annual cutting thereafter without replanting for many years. It is reported that a special decorticating machine has been evolved in Mexico so that the fiber may be used for papermaking. 2 illustrations. R.A.S.

FILTERING SPECIALTIES

BEYNON, E. Industrial research improves oil filters. Can. Chem. Processing 38, no. 5: 94, 96 (May, 1954).

The author describes the part played by the laboratory at Kralinator Ltd. at Preston, Ont. in the development and manufacture of automobile oil filters. New filter media are constantly being tried out; much work is being done on filters using pleated-paper elements. These have the advantage of offering low restriction to oil flow; to provide mechanical strength, the paper is impregnated with a phenolic-type resin which necessitates a heat-curing process during production. The filtering efficiency of such papers can vary greatly, depending on the paper base, the type of resin used, and the percentage of impregnation. The paper cartridges must be resistant to the effects of hot lubricating oils, water, various solvents, and other materials likely to be found in crankcase oils. The adhesives used in these cartridges must also be able to withstand all these conditions. The filter medium used must not be effective in removing additives used as oxidation and corrosion inhibitors and detergent dispersants. The work of the physical and chemical testing sections of the laboratory in checking the many variables is outlined. 1 table and 6 figures. E.S.

FLOTATION

HUKKI, R. T., and RINNE, RISTO. An electrophoretic investigation of the fundamentals of the Sveen-Pedersen flotation process. Paper and Timber (Finland) 36, no. 4a: 129-40 (Special number, April, 1954). [In English]

The electrophoretic behavior of fiber and filler under the influence of chemicals employed in the Sveen-Pedersen saveall flotation process (pH, alum, Sveen glue, and resin glue [Delthirna, Gillet] applied either separately or in various combinations) was investigated. The basic zeta potential (I)-pH relationship was established for four different chemical pulps (bleached coniferous sulfite, bleached aspen sulfite, unbleached sulfite, and unbleached sulfate), beaten and unbeaten mechanical pulps, and three fillers (kaolin, talc, and titanium dioxide). The apparatus and experimental technique employed are described; the results are discussed in considerable detail, sup-

plemented by diagrams. High quantitative accuracy is not claimed for the electrophoretic measurements performed; the agreement between these measurements and the experience of mill-scale tests is in general very good. Some of the important conclusions of this study are as follows: In water, the surfaces of solid components of paper are dominated by anions; in addition, the surfaces are polar and hydrophilic. The natural condition of the solids is characterized by dispersion and nonfloatability. The addition of alum will produce positively charged ions of aluminum, capable of attaching themselves on the surfaces of the solids, whereby the anionic domination of surfaces will be largely balanced by the new cations. Resulting low (I) may make flocculation possible. The surfaces, however, will remain polar, and the solids nonfloatable. The simultaneous presence of alum and resin glue in white water will result in a reaction product characterized by a positive charge and a strong adsorptivity on solid surfaces. If used in reasonable amounts, the alum-resin combination is a powerful flocculating agent. If used in excess, deflocculation may result from excess domination of surfaces by the new cations. At the same time the surfaces become coated with a nonpolar, hydrophobic, air-adsorbing, and oriented organic resinate layer (representing the typical collector coating in mineral flotation). This resinate layer is the principal collector in the Sveen-Pedersen process; by virtue of this phenomenon, the solids become floatable. The reactions involved in the flotation and collector properties of Sveen glue are explained. No specific frother is used, and the need for it does not seem to exist. The addition of a specific frothing agent might improve the flotation step, but its effect on the paper machine would probably be harmful. 1 table, 19 figures, and 36 references. E.S.

FLUID DYNAMICS

INDUSTRIAL AND ENGINEERING CHEMISTRY. Flow through porous media. Ind. Eng. Chem. 46, no. 6: 1163-246 (June, 1954).

Representatives from the various fields of specialization present concepts and techniques on the subject of flow through porous media in this symposium; the following sections are arranged according to authors and titles: Comings, E. W., Pruiss, C. E., and DeBord, C. Continuous settling and thickening—5 tables, 16 figures, and 19 references, p. 1164-72; Thompson, Dudley, and Vilbrandt, F. C. Effect of ultrasonic energy on settling of solids in phosphate tailing—10 tables, 16 figures, and 70 references, p. 1172-80; Happel, John, and Byrne, B. J. Motion of a sphere and fluid in a cylindrical tube—2 tables and 14 references, p. 1181-6; Happel, John, and Epstein, Norman. Cubical assemblages of uniform spheres—4 tables, 11 figures, and 33 references, p. 1187-94; Happel, John. Slow viscous flow through a mass of particles—3 references, p. 1194-5; Cunningham, G. E., Broughton, G., and Kraybill, R. R. Flow through textile filter media—4 tables, 6 figures, and 12 references, p. 1196-200; Silverblatt, Charles E., and Dahlstrom, Donald A. Moisture content of a fine-coal filter cake—7 tables, 11 figures, and 9 references, p. 1201-7; Dombrowski, H. S., and Brownell, L. E. Residual equilibrium saturation of porous media—5 tables, 13 figures, and 8 references, p. 1207-19; Kocatas, Babur M., and Cornell, David. Holdup and residual saturation of hexane in gravity-drained soybean flake beds—2 tables, 11 figures, and 5 references, p. 1219-24; Leva, Max, Lucas, Joseph M., and Frahme, Herman H. Effect of packing supports on mechanical operation of packed towers—1 table, 13 figures, and 4 references, p. 1225-8; Sakiadis, Byron C., and Johnson, A. I. Generalized correlation of flooding rates—5 tables, 9 figures, and 26 references, p. 1229-39; and Michaels, Alan S., and Lin, C. S. Permeability of kaolinite—4 tables, 10 figures, and 37 references, p. 1239-46. R.A.S.

FORESTS AND FORESTRY

FRIERSON, MANTON R., JR. A woodyard seedling program. Southern Pulp Paper Mfr. 17, no. 6: 81-2 (June, 1954); *cf.* B.I.P.C. 24: 714.

The method for obtaining free pine seedlings at the West Virginia Pulp & Paper Co.'s Charleston, S.C. mill is outlined; the program was devised in an attempt to distinguish those applicants who are sincerely interested from those simply taking advantage of the free program. R.A.S.

WAGNER, CORYDON, and COWLIN, ROBERT W. Criticism—U. S. Surveys tag behind; more industry cooperation. Defense—Forest Survey improves; review will be reliable. Pulp & Paper 28, no. 5: 102, 104, 106, 108 (May, 1954); Tappi 37, no. 6: 102A, 104A, 106A (June, 1954).

The first author criticizes the policy of the U. S. government in controlling the country's forest resources. The U. S. Forest Service was authorized to make a complete survey of timber resources in 1928; in 1952, 186 million acres, or about 30% of the acreage ordered inventoried, remained to be surveyed. The policy of buying up the timber lands for national forests, referred to as the hoarding of forests and merely protecting them from fire, should be replaced by a policy of practicing forestry, the continuous, economical, and profitable use of timber. The second author outlines the basic facts revealed by the Forest Survey and points out how these facts have been beneficial as the original source of comprehensive facts on the condition and character of the nation's timber resources. The method of accuracy control in sampling is described; the Forest Survey will be accelerated and intensified in furnishing up-to-date and complete data through the continued co-operation of many public and private agencies. The second reference presents only the first author's article. R.A.S.

HARD WOODS

BHAT, R. V., and GUHA, S. R. D. Indigenous cellulosic raw materials for the production of pulp, paper and board. Part XV. Chemical pulps and writing and printing papers from *Albizzia stipulata,* Boivin. Indian Forester 79, no. 9: 475-83 (1953); *cf.* B.I.P.C. 24: 22.

Albizzia stipulata, Boivin (I) is a large deciduous tree growing in the sub-Himalayan tract and in the southern parts of India, Ceylon, and Burma. A proximate analysis of the wood gave 60.17% Cross and Bevan cellulose, 23.71% lignin, and 18.28% pentosans. Laboratory sulfate cooks at Dehra Dun produced suitable pulps in good yields from the wood. The pulps are short-fibered, the average fiber length amounting to 1.02 mm.; they bleach to a satisfactory whiteness. Writing and printing papers of good formation and strength properties were made from a 100% bleached (I) sulfate furnish at the Institute on the experimental machine which has a maximum speed of 50 f.p.m. Since the wood is short-fibered, the admixture of 30% long-fibered bamboo pulp may be necessary in commercial production. 6 tables, 5 figures, 3 references, and 2 sample sheets (one printing and one writing paper) made from 100% (I) sulfate pulp. E.S.

BHAT, R. V., and VIRMANI, K. C. Indigenous cellulosic raw materials for the production of pulp, paper and board. Part XVI.

Chemical pulps and writing and printing papers from wattle woods (*Acacia decurrens*, Willd. and *Acacia mollissima*, Willd.). Indian Forester 79, no. 10: 526-38 (1953); Indian Pulp and Paper 8, no. 11: 505-13 (May, 1954); *cf.* abstract above.

Bleached sulfate pulps in satisfactory yield on a laboratory scale were obtained from two species of wattlewood, *Acacia decurrens* (I) and *Acacia mollissima* (II). The large-scale wattle plantations raised by the government of Madras for tanning bark should make considerable quantities of the wood available as a by-product in the not too distant future. The proximate analyses of (I) and (II) gave, respectively: 63.17 and 63.95% Cross and Bevan cellulose; 21.24 and 21.17% lignin, and 19.35 and 20.30% pentosans. The pulps are very short-fibered, the average fiber length of (I) being 0.86 mm. and of (II) 0.7 mm., so that a 40% admixture of long-fibered bamboo pulp is necessary for the production of writing and printing papers with satisfactory strength properties. 7 tables, 2 references, and 3 sample sheets, a printing paper made with 70% (I) and 30% bamboo pulp, a writing paper made with 60% (II) and 40% bamboo pulp, and a printing paper made with a 70% mixture of (I) and (II) and 30% bamboo pulp. E.S.

HISTORY

TSCHUDIN, FR. Sources for the early history of paper. Textil-Rundschau 9, no. 5: 244-51 (May, 1954). [In German]

Reference is made to chapter 68 of the Hou Han Shu (the official history of the Han Dynasty) which contains a biography of Ts'ai Lun; a translation of this biography is included. In addition, an apocryphal picture of the inventor of paper is presented, a reproduction of a rather recent woodcut now kept with the Sven Hedin collection in the etnographical museum at Stockholm, which originally decorated the shrine of a Chinese papermaker in Peking. 4 figures and 44 footnotes. E.S.

ILLUMINATION

METZELER, ALFRED. The design of lighting installations in the paper industry. Das Papier 8, no. 11/12: 209-14 (June, 1954). [In German; English and French summaries]

The author discusses a number of factors which should receive consideration in the planning of the lighting system in a paper mill, such as type of work, direction of flow of work, avoidance of glare and high contrasts, uniformity of lighting intensity, correct ratio of light and shadow, etc. The economy and efficiency of the illumination under different conditions are reviewed. 2 tables and 5 figures. E.S.

INSTRUMENTATION

HALL, G. A., JR. Instrumentation in stock preparation. Paper Mill News 77, no. 20: 111, 118, 139 (May 15, 1954).

Instruments for measuring and controlling stock consistency, pH, and rate of stock flow built by The Bristol Co., Waterbury, Conn. are described. E.S.

JOY, PAUL W. Sandpaper and ultrasonics. Instrumentation 7, no. 3: 16-17 (April-June, 1954).

A description is given of the Bendix Ultra-Viscoson, an instrument used to control the viscosity and amount of adhesive applied in the manufacture

of sandpaper at The Carborundum Company, Coated Products Division, Niagara Falls, N.Y. The control instrument consists of a probe, inserted into the adhesive flow line downstream from the pump, which produces ultrasonic waves and measures the energy required to cause layers of adhesive to slip back and forth over one another as a result of these waves. This energy is proportional to the viscosity of the material, thus constituting a measure of viscosity; the instrument adds just sufficient diluent to keep the viscosity at the correct value. Five beta gages on each of the four machines check extremely small variations in the thickness of the base material, adhesive coat, and application of abrasive grain (*cf.* B.I.P.C. 23: 120). 3 illustrations. R.A.S.

MURPHY, E. A. Flow and consistency control in stock preparation. Paper Mill News 77, no. 20: 86, 120, 122 (May 15, 1954).

ElectroniK consistency control (in some cases combined with graphic panels) installed by the Minneapolis-Honeywell Regulator Co. on blow tanks, brown-stock washers, bleach lines, etc., and venturi tubes for the measurement of stock flow in pipe lines are described. 8 figures. E.S.

PRESTON, K. E. Care of pressure and temperature gauges in your plant. Indian Pulp and Paper 8, no. 8: 387-9 (February, 1954).

The correct installation and maintenance of pressure gages and dial thermometers and antivibration mounting of instrument panels are discussed. 4 figures. E.S.

ROSENQVIST, GUSTAV V. How to derive the greatest benefit from instrumentation. Paper and Timber (Finland) 36, no. 4a: 177-88 (Special issue, April, 1954). [In Finnish; English summary]

Great progress has recently been made in instrumentation in the Finnish pulp and paper industry. In addition to the purchase of the instruments proper, the author emphasizes the need for the correct installation and maintenance, the appointment of a special crew and its place within the organization, and the establishment of an instrument shop for upkeep and repair. 14 figures and 5 references. E.S.

WALTER, LEO. Control of stock flow in paper making. Can. Pulp Paper Ind. 7, no. 6: 8-9 (June, 1954).

The application of automatic control to stock flow is discussed; methods of flow and blending, stock-pump, and stock-blending control (particularly an arrangement for sulfite and groundwood stock bleaching) are described. 2 flowsheets. R.A.S.

LIGNIN

AALTIO, ERKKI, and ROSCHIER, R. H. The chemical combination of lignin in aspenwood. Paper and Timber (Finland) 36, no. 4a: 157-72, 174 (Special number, April, 1954). [In Finnish; English summary]

Wood was extracted repeatedly with buffered neutral (pH 7) water and butanol at 158°C. This treatment caused the gradual solubilization of the wood, and both the wood residues and the liquors were analyzed after each cook, nine of which were made. Not only was the lignin solubilized, but carbohydrate material was also removed. Initially the experiments were made with pine and aspen, but only the latter was sufficiently soluble under the conditions used, so the series was carried out with this wood. The coarseness

or fineness of the wood had but little effect on its solubility. During the nine consecutive aspen cooks, 62.5% of the total wood and about 92.6% of the original lignin dissolved. In cooks 2-5, the ratio of lignin to pentosans was nearly constant (at 0.85); after cook 5, the wood residue was about 51.2%. In cooks 6-9, the lignin-pentosan ratio dropped to about 0.64; this drop in ratio was quite abrupt during the sixth cook. With this change a marked change in the methoxyl content of the recovered lignin was also noted. The recovered (Klason) lignin first contained 20-21% methoxyl; that recovered from the three final cooks contained about 15% methoxyl. The methoxyl content of the original aspenwood lignin amounted to 20.2%. Following the first three treatments, the lignin methoxyl in the residual wood remained approximately constant at 15.4-16.1%. The assumption is made that the lignin forms two different types of complexes with the pentosans, and that in each of these the character of the lignin varies. Simultaneously with this change in lignin-pentosan ratio a distinct fiberizing of the wood substance was observed, indicating that the middle lamella had been dissolved at this stage and that there was a connection between these lignin complexes and the morphology of the woody tissue. The complex with the lignin-pentosan ratio 0.85 seems to belong to the middle lamella and is removed during the earlier part of the digestion. The authors believe that when the ratio 0.65 is reached, the secondary layer is involved. When this complex dissolves, appreciable amounts of the cell-wall cellulose are also removed. There is also a possibility that this cellulose is combined with some lignin. In the very first digestion, the lignin-pentosan ratio is 1.35; this may be due to the removal of free lignin from the middle lamella. The authors explain the entire mechanism somewhat as follows: the hydrolytic action of the water cleaves the bonds between lignin and the carbohydrates; the former dissolves in the butanol, the latter in the water. Buffer effects prevent the condensation of the lignin. Qualitative sugar analyses after acid hydrolysis of the water-soluble components indicate by paper chromatography that xylose, arabinose, galactose, glucose, uronic anhydride, and small amounts of mannose and rhamnose are present. 16 tables, 14 figures, and 41 references.

L.E.W.

PEPPER, J. M., and HAGERMAN, D. C. The isolation and oxidation of aspen lignins. Can. J. Chem. 32, no. 6: 614-27 (June, 1954).

A study has been made of the conditions affecting the isolation of a lignin fraction by a procedure involving a moderate temperature catalytic hydrogenation of pre-extracted aspen wood meal. The effect of varying the initial hydrogen pressure, the catalyst, the time and maximum temperature of reaction, and the nature and acidity of the suspending medium were studied. The weight of the residual pulp, the effectiveness of lignin removal, the weight and methoxyl content of the resulting chloroform-soluble fraction containing the lignin, and the yields of vanillin and syringaldehyde obtained by the alkaline nitrobenzene oxidation of this same fraction were the factors serving as the bases for comparison. Initial hydrogen pressures greater than 500 p.s.i.g. were not required, although below this value there was some loss of efficiency. Neither the use of water or dioxane alone was satisfactory as a suspending medium, but the mixed aqueous-organic medium was required to remove the released lignin. Considering the resultant slight acidity of the reaction product, it is suggested that in such an isolation two separate stages are involved: that of the water functioning to wet and permeate the wood and serve as the acidic medium and that of the organic-solvent phase functioning to remove the liberated lignin after the hydrolytic cleavage. Data are presented and interpreted to indicate the existence of a lignin-carbohydrate complex which is cleaved under the conditions of catalytic hydrogenation. Under the conditions of these experiments practical tempera-

tures for lignin removal are in the range 170-180°C. for an aqueous-organic solvent medium, but some 30 degrees lower for an 85% acetic acid medium. Although it has been possible to isolate all the lignin, with good methoxyl recovery, consistently no more than approximately 50% of the required aldehydes is obtainable on oxidation. The increasing value of the syringaldehyde-vanillin ratio with increasing temperature is due to a decreased vanillin yield. Indications are that the use of copper chromium oxide may be preferred over Raney nickel as a catalyst for this isolation procedure. 3 tables and 17 references. E.S.

RICHTER, G. A., and PANCOAST, L. H., JR. Sulphonation of wood lignin. Tappi 37, no. 6: 263-72 (June, 1954).

The authors report on work covering sulfonation and delignification of several wood species with sulfurous acid solutions of increasing concentrations and over a wide range of temperatures. Low-temperature sulfonations were made over periods of time extending to 16 months. In many instances the low-temperature sulfonations were followed by short high-temperature digestions. The degree of sulfonation of the wood lignin was determined and the removal of solubilized lignin measured. It is shown that: (1) With 10% sulfur dioxide solution there is progressive extraction of lignin over long periods of treatment at room temperature, but at no time up to a 16-month soak did the chemically combined sulfur in the wood substance exceed 8% based on lignin. (2) The rate and degree of sulfonation are dependent on sulfur dioxide concentration and temperature; at a given sulfur dioxide concentration, rate of sulfonation is depressed as increasing percentages of combined sulfur dioxide are added to the solution. (3) Combined sulfur in the extracted lignosulfonate reaches levels of 8-10% when sulfonations are carried out at room temperature. (4) Prehydrolysis interferes both with low-temperature sulfonation and subsequent pulping in sulfur dioxide solution at elevated temperature. (5) High-temperature hydrolysis of presulfonated wood with solutions containing no sulfur dioxide resulted in only partial delignification, except where presulfonation had been done with sulfur dioxide solution to a level of over 4% sulfur based on lignin. A similar delignification of wood which had been sulfonated with bisulfite or sulfite at high temperature proved much more difficult. (6) The sulfonation of birch lignin with low temperature sulfur dioxide solution is much slower than that found with hemlock, spruce, and Douglas-fir. (7) A very rapid and almost complete extraction of lignin from hemlock is possible by a process comprising a two-week sulfonation with 10% sulfur dioxide solution at room temperature followed by a two- to four-hour digestion in the same liquor at 120°C. 13 tables, 16 figures, and 5 references. E.S.

LIME AND LIMESTONE

BAUER, WOLF G. How to control heat for calciners. Chem. Eng. 61, no. 5: 193-200 (May, 1954).

The operation of modern calciners (including rotary kilns) is outlined with emphasis on the control of heat. The influence of the operating variables on the efficiency of calcination and on the distribution of heat within the kiln is discussed in a qualitative manner for various types of fuels and for different methods of firing. 4 figures. W.L.I.

MACHINERY

BELOIT IRON WORKS. Beloit improvements for paper machines. Paper Mill News 77, no. 24: 76, 78, 80 (June 12, 1954).

A general survey of improvements in various sections of paper machines

developed by Beloit Iron Works is given, including air-cushioned inlets, improved forming boards and water deflectors, suction pick-up arrangements, suction rolls with air-loaded packing strips, air-bleed-type presses, driers (including Yankee driers) for higher steam pressures, antideflection rolls for calenders, new winder features, the patented fixed-ratio drive, and supercalenders with fully controllable pneumatic loading. 6 figures. E.S.

DOWNINGTOWN MANUFACTURING COMPANY. Pulping methods. Paper Mill News 77, no. 20: 83, 119 (May 15, 1954).

A progress report of improvements and simplifications of existing pulping methods covers batch and continuous pulpers (FIBREpulpers), refiners (FIBREfiners), jordans, agitators, and engineering facilities of the company. 4 figures. E.S.

LAEMMERMANN, FRED W. New machines and developments by Bagley and Sewall Company. Paper Mill News 77, no. 24: 108-9 (June 12, 1954).

Recent paper-machine installations in the United States and abroad and improvements to individual sections of the paper machine are reviewed briefly. The company has also taken over the manufacture of the Roberts grinder and the Savalla saveall in the United States. 2 illustrations. E.S.

MACHINERY—BEATERS

RANDECKER, L. E. The beater. Paper Mill News 77, no. 20: 46-8, 50, 52, 54, 56, 58, 60, 62, 64, 66, 69-72, 74, 76-8, 80-1 (May 15, 1954).

The object of the present article is the presentation of data and arguments designed to bring the beater as a pulp-preparation instrument back into proper focus. The author feels strongly that the beater has lost its traditional place in the industry for reasons generally not relevant to good papermaking, in addition to the practical fact that until recently no manufacturer has offered a beater with the bar-surface work capacity of the jordan or refiner. Several installations of a greatly improved high-capacity beater with excellent performance records have been made in recent years without yet reaching the full potential of the design. In conjunction with this development a series of tests were run on an experimental beater in which roll pressure, roll speeds, and quantity to the roll were varied. At the same time, semichemical hardwood pulp, which is now and will continue creating a new era in papermaking, compels a different approach to pulp preparation. These tests, the performance and potentialities of the improved beater, and the advent of hardwood semichemical pulp present a set of conditions which supports the reconsideration of the relative abilities of modern beaters, refiners, and jordans. The data are divided into six parts and discussed under the following subheadings: general; the effect of roll pressure and time on treatment; the effect of roll speed on treatment; the effect of roll feed (quantity fed to roll) on treatment; the effect of roll speed, roll feed, and roll pressure on power consumption; and conclusion. The author argues that the modern beater with the roll out of the tub has the potential of a very high capacity, particularly well designed to beat a blended furnish including semichemical pulp which requires only slight beating or none at all, and that the batch beaters offer much better chances for maximum control of the treatment which the pulp receives during stock preparation than continuous-flow designs. The importance of beater-room control is strongly emphasized. 37 tables and 8 figures. E.S.

MACHINERY—BELTING

SCHEU, DONALD R. Latest ideas on rubber belt use in pulp mills. Paper Trade J. 138, no. 24: 24, 26, 28 (June 11, 1954).

Uses, requirements, and auxiliary equipment are covered in a discussion of various types of rubber conveyor belts, including yard, recovery, debarking-drum feeder, sorting, chipper-feed, chip-handling, pulp-handling, and bark-handling belts as applied in pulp mills. 4 illustrations. R.A.S.

MACHINERY—BLOWERS

ANON. The Sulzer system of water extraction for paper machines. Paper Mill News 77, no. 24: 110, 112-13 (June 12, 1954); *cf.* B.I.P.C. 23: 559.

The design and operating performance of the Sulzer Turbair blower are described. 4 figures. E.S.

MACHINERY—BOARD MACHINES

THE BLACK-CLAWSON COMPANY, *Hamilton, Ohio.* Black-Clawson machines and equipment. Paper Mill News 77, no. 24: 88-90 (June 12, 1954).

Equipment incorporated in the new eight-cylinder board machine installed at the Manchester Board & Paper Co., Richmond, Va. (*cf.* B.I.P.C. 24: 701) is shown in illustrations and sketches provided with suitable explanations. 8 figures. E.S.

MACHINERY—CALENDERS

HANNIGAN, J. Supercalenders—superheadaches. Tappi 37, no. 6: 148-51A (June, 1954).

The author discusses the problems connected with supercalendering machine-coated paper. E.S.

MACHINERY—CONSISTENCY REGULATORS

POIRIER CONTROL COMPANY, *Waterville, Maine.* Stock regulation. Paper Mill News 77, no. 20: 128-9 (May 15, 1954).

The development of a practical and economical design of Dual Control for regulating consistency and volume on board machines is described. E.S.

MACHINERY—CONVERTING MACHINERY

ANON. DRUPA 1954; a preview. Wochbl. Papierfabrik. 82, no. 8: 253-60 (April 30, 1954). [In German]

A preview of German converting machinery to be exhibited by prominent machinery manufacturers at the DRUPA of 1954 is presented. 19 illustrations. E.S.

ANON. The manufacture of paper napkins. Allgem. Papier-Rundschau no. 9: 473-6 (May 5, 1954). [In German]

The development of German converting machinery for the manufacture and printing of paper napkins is outlined by means of five different models of the firm J. H. Spörl, Düsseldorf; these machines permit the combination of different printing processes. In contrast to the German models, an American mass-production model for one type of plain white napkins without printing is also described. 6 illustrations. E.S.

BIAGOSCH, HEINRICH. Tools with opposed cutting edges for insertion into multipurpose converting machinery. Allgem. Papier-Rundschau no. 9: 477-8, 480-3; no. 10: 537-42 (May 5, 20, 1954). [In German]

Different types of corner-cutting, punching-out, slotting, etc. machines used in paper and board conversion are described, and directions for the correct installation, fastening, adjusting, and reordering of the cutting tools are given. 51 figures and 9 footnotes. E.S.

MACHINERY—DRIVE, ELECTRIC

ANON. How Oregon mill converted to new machine drive. Pulp & Paper 28, no. 5: 88, 90 (May, 1954).

When a tub-size press was added to the No. 1 paper machine making bond papers at the Oregon Pulp & Paper Co., Salem, Ore., the machine was separated into two sections and the new unit installed between them. The steam-turbine drive formerly powering the entire machine now drives only the first section, and the turbine exhaust steam is utilized in the driers. A Reliance sectional electric drive with electronic regulators was selected for powering the size press and after-drier units. Some details of the new drive are given. 3 illustrations. E.S.

BARANY, T. E. Electronic sectional papermachine drives. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 35, no. 1: 71-85; discussion: 85-92 (February, 1954); *cf.* B.I.P.C. 24: 369.

The electronically controlled multigenerator d.c. sectional drive installed on the new paper machine of the Guard Bridge Paper Co. Ltd. in Scotland, including the driving unit and its associated control equipment, is described in some detail. Recorder charts are given illustrating various aspects of the performance of this type of drive. 1 table and 10 figures. E.S.

CALHOUN, O. L. Counter rolls are wound at low cost by direct method. Pulp & Paper 28, no. 6: 90, 92, 94-5 (June, 1954); *cf.* B.I.P.C. 23: 490.

The Beloit Iron Works rewinder installed at the Crossett Paper Mills, Crossett, Ark. receives the 17-ton mill roll directly from the paper machine to produce 9-inch counter rolls at a web speed up to 4000 f.p.m. The unit is powered by a combination electrical and mechanical drive unit built by Reliance Electric & Engineering Co. Details are given of this drive, whose noteworthy operational features include rapid acceleration, deceleration, and roll handling. 4 figures. E.S.

SORENSON, R. F. An engineering analysis of down time of electric sectional drives. Tappi 37, no. 6: 249-52 (June, 1954).

The electric sectional paper-machine drive is always the subject of much discussion, including its merits and troubles caused by different maintenance problems. However, to date accurate records have not been available to make possible correct appraisement and comparisons between mills. To obtain reliable figures, the Electrical Committee of TAPPI appointed a subcommittee to make a study of lost time directly chargeable to electric drives. Questionnaires were sent to 12 co-operating mills representing a wide variety of speeds and paper grades. The coded data were handled through the TAPPI office, and a standard form was developed for reporting lost time. No thorough analysis of the data has been attempted because insufficient time

has been available since the start of the program. However, it is emphasized that the keeping of such records is not only possible, but that it offers definite advantages to the individual mill in analyzing and controlling lost time and improving interdepartmental relationships and the attitude of operating electricians. Records will also provide a basis for future comparisons with other mills in the industry and with other types of drives. Once a procedure has been established, the time spent in keeping these records is not great. 5 figures and 1 lost-time sample chart. E.S.

MACHINERY—DRYERS

PURDY, D. J. A new battery-type oven for drying pulp and paper samples. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 35, no. 1: 39-46 (February, 1954).

A new battery-type of drying oven, consisting of several separate compartments with a common air-circulating plant, and its air-heating circuit are described in some detail. Data on power consumption and drying times for various types of pulp and paper are included. 2 tables and 4 figures. E.S.

MACHINERY—FELTS

CORNELL, JOHN. Synthetic fibres and paper machine felts. Paper Mill News 77, no. 24: 82, 84, 86 (June 12, 1954).

In the form of an interview with executives of the Albany Felt Co., Albany, N.Y., the use and limitations of synthetic fibers, nylon in particular, in papermakers' felts, and recent developments in felt design required by higher machine speeds, the upkeep of felt life, and special felt treatments to counteract the detrimental effect of chemicals left in the pulp, bacteria, etc. are discussed. E.S.

RACE, E. Experience with synthetic fibers in felts in Europe. Paper Trade J. 138, no. 24: 17-18 (June 11, 1954); *cf.* B.I.P.C. 24: 719.

Typical examples from England and the continent of Europe of the results of the use of press felts containing filler yarns of wool-nylon blends are reported. It is concluded that longer life is experienced, particularly in cases where felts are subjected to severe mechanical abrasion. There is also definite evidence that all-synthetic drier felts lead to economy in steam, but problems arise in their dimensional stability. R.A.S.

RACE, E. Modern trends in paper makers' felts. Svensk Papperstidn. 57, no. 10: 353-62 (May 31, 1954). [In English] *cf.* B.I.P.C. 24: 110.

A somewhat similar although not identical description of the manufacture and required properties of wet-end (I) and drier (II) felts as in the previous reference is given. The use of wool and synthetic fibers for (I) and different cotton-weave structures for (II) are also covered. 14 figures and 5 references. E.S.

WOODSIDE, LARRY M. What is a felt service engineer? Pulp & Paper 28, no. 5: 112, 114, 116, 119 (May, 1954).

The most important requisites for a competent felt-service engineer are a papermaking background (particularly a knowledge of terminology), felt-

making training, and experience. Several case histories are given describing problems in mill production which were solved with the aid of a felt-service engineer. R.A.S.

MACHINERY—FILTERS

RONNINGEN, HELMER A. How iron bacteria [are] being successfully removed with wire cloth filters. Paper Trade J. 138, no. 25: 26, 28 (June 18, 1954).

Problems of rust discoloration and plugging of valves and pipes caused by high iron-content well water (high iron bacteria or Crenothrix) have been relieved with the use of fine-mesh, wire-cloth filters. Examples are given of specific mills which eliminated the iron problem with Ronningen filters in different mesh and combinations when applied to various pieces of equipment in the mills. 3 illustrations. R.A.S.

MACHINERY—HEAD BOX

OSCARSON, G. L. Precise control of fan pumps with magnetic slip couplings. Paper Mill News 77, no. 24: 68 (June 12, 1954).

The use of a variable speed pump, driven by a synchronous motor and controlled by a magnetic slip coupling and magnetic amplified speed control, for maintaining the liquid level in high-speed paper-machine headboxes and a new technique in recorded speed tests for checking the accuracy of the degree of speed control are described. The percentage of deviation (as a percentage of full speed) was found to be a maximum of 0.064%. 1 table and 3 figures. E.S.

MACHINERY—MIXING APPARATUS

QUILLEN, CHARLES S. Mixing, the universal operation. Chem. Eng. 61, no. 6: 177-224 (June, 1954).

Although nearly every process uses mixing, most of them at several different points, the mixing operation is still very much of an art, based largely on accumulated experience. The author summarizes this experience in a 48-page report under the six subdivisions: general information, liquid mixing, paste mixing, plastics mixing, solids mixing, and continuous mixing. 6 tables and numerous illustrations. E.S.

MACHINERY—MOISTENING DEVICES

DAY, D. G. Positive uniform control of moisture, chemical and sizing applications on the paper machine. Paper Mill News 77, no. 24: 124-5 (June 12, 1954).

A unit developed by the Spray Engineering Co., Somerville, Mass. consists of an assembly of compressed-air operated atomizing spray heads which distribute a fine spray or mist of uniform density over any given width. Different sizes of spray heads and nozzle combinations provide a wide range of capacities, and controls permit the adjustment of the volume of the liquid sprayed without the necessity of changing the distance of the spray battery and the web. Originally developed for moistening purposes only, the equipment was found equally adaptable for the application of chemicals for sizing or paper-conversion processes. When spraying water, the spray battery is not housed, because it is not important if some escapes to the atmosphere. If a liquid other than water is applied, suitable shields or baffles are erected to prevent its diffusion; if the fumes are harmful, provision is made for their proper exhaustion. 4 figures. E.S.

MACHINERY—PACKAGING MACHINERY

ANON. Automatic milk carton packer first of its kind for dairy industry use. Packaging Parade 22, no. 257: 121 (June, 1954).

A machine for automatically casing filled cartons of milk, announced by American Can Co., is described; the machine, which can handle quarts, pints, and half-pints, is timed to the filling machine and is capable of handling 200 cartons/minute. 2 illustrations. R.A.S.

ANON. Automatic prepackaging of potatoes: production rate 2000 bags per hour. Packaging Parade 22, no. 257: 116, 118 (June, 1954).

An automatic prepackaging machine bags 10-pound portions of potatoes and delivers the bags for subsequent operations at a rate as high as 2000 bags/hour at Baker Produce Co., Kennewick, Wash. Mesh, paper, and polyethylene bags can be used; with the latter two, rubber-surfaced shoes are required to hold the bag. 6 illustrations. R.A.S.

MACHINERY—PRESSES

THE BAUER BROS. COMPANY, *Springfield, Ohio.* Bauer develops 'Pressafiner'. Paper Mill News 77, no. 26: 8 (June 26, 1954); *cf.* B.I.P.C. 24: 805.

The Pressafiner, a continuous screw press with separately driven feed and compression screws operating at different speeds, is described. The advantages of the press for expressing fluids from cooked wood chips, as demonstrated in mill-operation and laboratory tests conducted over a period of 18 months, are listed. 1 illustration. R.A.S.

NEBEL, FRITZ. The pressing of wet-machine boards. Wochbl. Papierfabrik. 82, no. 7: 216-17 (April 15, 1954). [In German]

Directions for the correct dewatering of wet-machine boards first on the make-up roll and then in hydraulic presses are given; calculations for determining the efficiency of the operations involved are included. 2 tables. E.S.

MACHINERY—PULPERS

COWLES, EDWIN. The Hydrabeater and the Hydraslusher. Paper Mill News 77, no. 20: 108-10, 112-15 (May 15, 1954).

The two pulpers were originally developed by The Cowles Co., Cayuga, N.Y. under the trade names Beatapulper and Aquapulper, respectively; they are now manufactured and sold under the trade names Hydrabeater and Hydraslusher under an exclusive patent license by the Shartle Bros. Machine Division of The Black-Clawson Co., Middletown, Ohio. The construction, mode of operation, and applications of both pulpers are outlined. 14 figures. E.S.

MACHINERY—PUMPS

CROMWELL, C. E. When does it pay to replace a pump? Paper Trade J. 138, no. 25: 22-4 (June 18, 1954).

Power, depreciation, and repair costs may run the hidden costs of operating an old pump higher than the price of a modern replacement. A chart is presented whereby calculation of power-cost-savings and capitalization amounts can be approximated quickly and within 2% accuracy; examples are given

using the amounts in the chart and showing the improvements in efficiency which have been made. 2 tables and 2 figures. R.A.S.

PROCOPI, JOHN. Increased productivity through accurate metering of alum and wet strength resins. Paper Ind. 36, no. 3: 296 (June, 1954).

A system of air-powered, controlled-volume pumps for the precise metering of wet-strength resins and alum (diluted from higher consistencies to the required solution) to pulp is outlined, eliminating waste and the need for large alum storage tanks. 1 diagram. E.S.

MACHINERY—REFINERS

THE BAUER BROS. COMPANY, *Springfield, Ohio.* Bauer No. 440 pump-through refiner. Paper Mill News 77, no. 20: 116-17, 129 (May 15, 1954).

The construction of a new revolving-disk mill refiner for stock-preparation service is described; stock consistency is preferred at 4-6%, although the machine is effective at both higher and lower densities. 1 illustration. E.S.

MACHINERY—SAWS

ADAIR, NELSON T. Get acquainted with your chain-saw motor. Pulp Paper Mag. Can. 55, no. 6: 157, 159 (May, 1954).

The author discusses the operation and mechanics of a chain-saw motor, particularly the recoil starter, two-cycle motor, ignition, clutch, cleaning, and lubrication; the manufacturer's manual is the best source of information on an individual saw. R.A.S.

CANADIAN PULP AND PAPER ASSOCIATION. *Woodlands Section. Committee on Cutting Tools.* Power saws—models and specifications. Pulp Paper Mag. Can. 55, no. 6: 154-5 (May, 1954).

A table is presented showing models and specifications of straight-blade and bow-blade power saws, giving such information as bore and stroke, ignition make, carburetor type and make, clutch control, drive, side-cutting arrangement, and maker's name and address. 1 table. R.A.S.

CANADIAN PULP AND PAPER ASSOCIATION. *Woodlands Section. Committee on Training of Woods Labour and Personnel.* Review of power saw manuals. Pulp Paper Mag. Can. 55, no. 6: 160, 162, 165 (May, 1954).

The committee gives suggestions as to the form and content of a manual on power saw instructions and parts; sections outlined for the contents include general information, tools required for the saw, setting the saw up for use, chain care and filing instructions, operating the saw in the woods, maintenance, engine troubles and T.C.R. charts, safety, fire prevention, and parts and price list. R.A.S.

LOGAN, B. A. [Moderator] The proper use of the power saw as a cutting tool. Pulp Paper Mag. Can. 55, no. 6: 136-8, 141, 143-4, 146, 149-50 (May, 1954).

The members of a panel present the views of the operator and the trainer in the proper use of power saws; panel members and titles of the various sections include: Stephens, T. K. Preventive maintenance, p. 137; Cowan, T. A.

Preventive maintenance, p. 137-8; Wright, C. C. Cutting techniques, p. 138, 141; Kerr, L. G. Crew organization, p. 141, 143; Douglas, L. C. Crew organization, p. 143-4; Kirkpatrick, R. E. Parts supply set-up and service organization, p. 144, 146; and Morris, G. H. Parts supply set-up and service organization, p. 146, 149-50. R.A.S.

MACHINERY—SCREENS

HOMANS, ROY, and PINEO, MALCOLM B. The flat screen versus the Ahlfors screen for bleachable pine and hardwood sulphate pulp. Tappi 37, no. 6: 257-62 (June, 1954).

In an attempt to reduce the high first-cost installation, floor-space requirements, and over-all operating and maintenance costs of a flat-screen installation (I) in kraft mills producing high-quality bleached pulp, a high-density screening system using an Ahlfors screen (II) was installed on a trial basis. It was not too successful because it did not allow an accurate control of consistency; the variations changed the rate of rejection appreciably and made it difficult to maintain a constant flow of stock through the unit. A permanent installation would necessitate the control of consistency within quite narrow limits. The major objective of the present study was the evaluation of the productive capacity of (II) in relation to the conventional (I); from the present studies it is concluded that (II) will produce the equivalent of two 14-plate sections of (I) on both pine and hardwood pulps. The productive capacities of the two screening methods are in direct relationship to the stock consistencies supplied to the units. Under proper control it would appear that a high-density screening unit would include the following advantages: high production rate per unit of screening area, satisfactory separation of fiber and dirt, lower capital cost, decreased decker capacity, possible operating man-hour savings, and reduction in maintenance cost with a decrease in screening area. 11 tables and 2 diagrams. E.S.

RATLIFF, F. COOPER. Use of high intensity screens in sulphate pulp handling for coarse papers. Tappi 37, no. 6: 232-5 (June, 1954); Pulp & Paper 28, no. 7: 74, 76, 78 (July, 1954). [Abridgment]

A Lindblad high-intensity screening system was recently installed in Gaylord Container Corp.'s Bogalusa, La. sulfate pulp mill. The problem involved in expanding the screening operation, the solution of the problem, the results expected, and the results obtained from the completed installation are discussed. Economic studies by process engineering and construction engineering showed that whereas high-intensity screens themselves were more expensive than other types, the over-all installed cost was considerably less. It was expected that a maximum capacity of 500 tons of airdry pulp/day through four Lindblad high-intensity screens connected as planned would be obtained. The quality of the pulp was expected to be satisfactory for manufacture of cylinder liners, wrapping, and bag papers. Test results have shown that expected performance was obtained, and it is believed that this type of screen is a satisfactory solution to the specific problem. 1 table and 3 figures in the first reference and 10 figures in the second. E.S.

MACHINERY—SHAFTS

ANON. Aero-Shaft expanding reel spindle. World's Paper Trade Rev. 141, no. 21: 1704 (May 27, 1954); Paper Box Bag Maker: 284 (June, 1954).

The Aero-Shaft spindle (I) invented by the Swedish engineer Lage Grettve

involves a hollow axle with valve for the intake and outflow of compressed air. Drawn over the axle is a rubber tube; outside this tube lie steel ribs. Compressed air from either a compressor or hand pump causes the tube to expand, pressing the ribs against the inner diameter of the core of paper rolls, thereby holding it in place. (I) is being manufactured to fit core diameters of 2.25-10 inches. An alternative construction for lifting reels with block and tackle has been built on the same principle. 2 illustrations. E.S.

MACHINERY—SPREADERS

HAMMETT, J. B. Vari-Bow expander permits variation of sheet and felt spreading effect. Paper Mill News 77, no. 24: 92, 94 (June 12, 1954).

Following a brief description of the construction and applications of Mount Hope free-wheeling or fixed-bow expanders, an adjustable type, the Vari-Bow expander, is discussed. It bows the full length of the roll and is adjustable from only one end. 7 figures. E.S.

MACHINERY—WEB TRANSFER

MOORHEAD, HAROLD. Powell River installs first Millspaugh suction pick-up in Canada. World's Paper Trade Rev. 141, no. 21: 1658, 1660 (May 27, 1954).

Millspaugh Limited of Sheffield, England supplied the vacuum transfer equipment for the No. 8 newsprint machine at Powell River. A brief description of the salient features of the installation is given. With the exception of minor startup problems, the equipment has operated satisfactorily since its installation; the speed has been increased from 1600 to over 1700 f.p.m., the sulfite furnish has been considerably decreased, sheet strength and quality have been maintained, and breaks at the couch have become a thing of the past. 2 diagrams. E.S.

PETERS, IRVING H. Suction pickup felts; factors governing their design and some observations on performance. Paper Mill News 77, no. 24: 100, 102, 104, 106 (June 12, 1954).

The desire to overcome the limitations in speed which result from the open draw between the wire and the first press was the moving factor which brought about the invention of some of the early closed machines, i.e., machines in which the sheet is supported by a felt in the draw normally existing between the wire and the first press (Harper, Edwards attachment, and Yankee machines). The felts on these three types of machines pick the sheet from the wire by the forces of surface tension and also by those forces which are due to a pressure differential across the sheet. A very level dense felt with its surface thoroughly wetted to provide a complete film of water will give the best pickup operation on these machines. The method of picking the sheet off the wire with the aid of vacuum or true suction pickup (which was first tried in 1950) requires light open felts with a relatively high water and air porosity; with these felts much more water is carried from the wire into the press section so that more water-removal equipment is required. Typical suction-pickup arrangements in use today are illustrated by sketches. At present, suction-pickup machines are being operated at over 1800 f.p.m. on lightweight kraft, over 1700 f.p.m. on news, and over 1500 f.p.m. on toweling. When certain minor difficulties are overcome, it will undoubtedly be possible to run much faster. 2 tables and 12 figures. E.S.

MACHINERY—WIRES

GUGEREL, KARL. The wire cloth of the paper machine, its manufacture and treatment. Wochbl. Papierfabrik. 82, no. 6: 179-83 (March 31, 1954). [In German]

Following a brief historical introduction, the author describes the processes involved in the weaving of Fourdrinier wires, different types of weave, the problems presented by the seam, the stresses to which wires are subjected in the paper machine, and correct changing, breaking in, cleaning, and mending of wires. E.S.

TSCHUPP, R. E. How to cut wire cleaning down-time. Paper Trade J. 138, no. 24: 14-15 (June 11, 1954).

A method of cleaning the Fourdrinier wire with an alkaline detergent solution flowed onto the wire from a 50-gallon drum located above the wire or onto an old felt for removing heavy deposits of pitch and tar, and inhibited acid solutions used to remove lime and sulfate scale from the wire are discussed. 1 figure. R.A.S.

MATERIALS HANDLING

ANON. Warehouse tour uncovers savings-producing factors. Packaging Parade 22, no. 257: 60-1 (June, 1954).

Faster handling of orders and increased shipping volume/man-hour are among the results which The Mennen Co., Morristown, N.J. is now getting with the co-ordinated shipping and handling procedures developed for its new plant. A Weber stencil giving necessary data for each shipment is prepared at the same time as the invoice and bill of lading set; this stencil permits marking of cases as fast as they move on the conveyor belt. 6 illustrations. R.A.S.

METERS AND RECORDERS

MINNEAPOLIS-HONEYWELL REGULATOR COMPANY. Moisture control in paper making. Paper Mill News 77, no. 24: 118 (June 12, 1954).

The Brown electronic Moist-O-Graph recorder (which has been used for paper-moisture measurements for many years) is now available for moisture control. The arrangement of the instruments in a cascade-control system and their mode of operation are outlined. 1 diagram. E.S.

MICROSCOPY (ELECTRON)

ASUNMAA, SAARA. A note on the electron microscope study of cellulose fibres in ultrathin sections after treatment with thallous ethylate (An attempt to produce a specific electron staining). Svensk Papperstidn. 57, no. 10: 367-8 + 4 plates (May 31, 1954). [In English; German and Swedish summaries]

For the study of ultrathin sections (200-300 A.) of essentially unswollen spruce holocellulose fibers (produced by Jayme's procedure), the sectioning method and microtome of Sjöstrand (*cf.* Experientia 9: 114-15 [1953]) after embedding of the fibers in methacrylate have been used. The contrast in the sections was enhanced by treatment of the samples with thallous ethylate. The variations in the distribution of thallium in the fiber sections are demonstrated and some dimensions are given. The reaction of thallous ethylate with hydroxyl groups in the fiber needs further study to improve its use-

fulness in the determination of the accessibility of cellulose and as a specific electron-staining procedure. 6 electron micrographs and 16 references. E.S.

MILL CONSTRUCTION

BELLOS, A. G. Bleach plant engineering and design. Tappi 37, no. 6: 146-8A (June, 1954).

Materials and methods of construction in bleach plant design are reviewed briefly. E.S.

MILL CONTROL

ELLIOTT, NORMAN J. Production planning and control. Chapter 6—A system for folding carton manufacturers. Boxboard Containers 72, no. 738: 24-7 (June, 1954); *cf.* B.I.P.C. 24: 811.

The author outlines a procedure to effect an orderly and expeditious flow of work through a folding box factory; the basic principles of planning and machine loading are the same as for setup boxes (described in the previous reference) and differ principally in detail by reason of the difference of production process and size of order. The first step in control is a route sheet or traveling work order sent to all departments. On the basis of information gathered on this sheet, issue, job, and down-time tickets designed to provide for punching coded information along the edges are filled out, to be later collected and filed. 4 production-control forms. R.A.S.

MILL MANAGEMENT

GARDNER, COLIN, III. Getting the most from employee benefits. Paper Trade J. 138, no. 23: 24, 28-9 (June 4, 1954).

The author discusses the philosophy of management practiced by The Gardner Board & Carton Co. as it applies to employee relations, and the ways in which that philosophy is applied to secure employee understanding and appreciation of the accomplishments of management with respect to employee benefits. R.A.S.

NICHOLSON, G. W. E. Industrial management and human relations. Southern Pulp Paper Mfr. 17, no. 6: 52, 55 (June, 1954); Tappi 37, no. 7: 32A, 34A (July, 1954).

The phase of management which deals with the human and social needs of an organization is emphasized; management can bring about an improvement of foreman-worker relationship by providing an atmosphere which recognizes the importance of human needs as well as the necessity for quality and output in the manufacturing process. R.A.S.

PACKAGING

ANON. New approach to checkweighing problem. Packaging Parade 22, no. 257: 64-5 (June, 1954).

Two Hi-Speed Checkweighers were incorporated in the packaging line of cake mixes at the Chicago plant of General Mills, Inc. to detect off-weight packages and push them onto a stub conveyor before the closing and sealing operations. 7 illustrations. R.A.S.

ANON. A new way in Japan. Modern Packaging 27, no. 10: 123-5 (June, 1954).

Ancient oriental methods of packaging and shipping in Japan are giving way to large-scale adoption of modern standardized packaging and package

handling, based on American procedures, through the co-operative efforts of the Japanese Procurement Agency (a U. S. Army agency), the Japanese government, and Japanese manufacturers. 7 illustrations. R.A.S.

ANON. Toys and games. Modern Packaging 27, no. 10: 104-9, 211, 214, 216 (June, 1954).

The influence of design and function in packaging in the toymaking industry, particularly under self-service and self-selection selling conditions, is considered an important factor in the large sales volume experienced by the industry in the past year. 18 illustrations and 6 references. R.A.S.

BRUSEWITZ, RALPH. A retailer looks at produce prepackaging. Am. Paper Merchant 51, no. 6: 21, 63 (June, 1954).

The need for a slow beginning in a program of produce prepackaging is emphasized, i.e., starting with head lettuce, apples, lemons, and onions; after successful merchandising of these items, an expansion to all produce can be made. R.A.S.

PACKAGING—OPENERS

ANON. Swing to tear-strip cases. Modern Packaging 27, no. 10: 116-22, 223-4 (June, 1954).

Tear-strip openings for corrugated shipping containers are rapidly finding increased favor for many types of packaged products. Advantages of this method of opening are protection against damaging the product while opening, easier marking of price, easier removal for shelf stacking, and handy re-use as customer carry-out. Different types of tear openings are described, including filament-tape and slit-liner constructions. 21 illustrations. R.A.S.

PAPER—MERCHANDISING

ANON. Obtaining the paper quotation. Paper Making 73, no. 1: 10-11 (Spring, 1954).

To give an accurate and the best price quotation for a given paper order, the paper merchant must have all the essential information, including a sample pattern of the largest possible size, the quantity and size of paper required, and the process of printing to which the paper is to be subjected. The necessity for care in the handling of paper is emphasized. R.A.S.

CROCKER, DOUGLAS A. Big long-range potentials for merchants seen in napkins. Paper & Paper Products 95, no. 23: 2-3 (June 5, 1954); *cf.* B.I.P.C. 24: 817.

The paper-napkin industry has shown a greater increase in production since the end of the second world war than any other tissue product; this is the result of great improvements in quality (draping-type napkins) and skillful merchandising by leading members in the industry. Statistical data are included which show an increase of about 126% in the household-type napkin from 1946 to 1952, whereas industrial types increased only 21%, toilet tissue 35%, paper towels 30%, and facial tissue 31% during the same period. Both household and industrial napkins seem to offer paper merchants the long-range potentials for a profitable business. 1 table. R.A.S.

LAPP, CHARLES L. Solving your selling problems—33 proposals for better marketing. Paper & Paper Products 95, no. 23: 1, 6-7, 9; no. 24: 2-3 (June 5, 20, 1954); Am. Paper Merchant 51, no. 7: 30, 32, 72 (July, 1954); *cf.* B.I.P.C. 24: 829.

The author lists and discusses 33 suggestions for paper merchants in diagnosing, prescribing, taking action, and checking up in respect to objectives; forecasting sales; handling products; charging prices; recruiting, training, and supervising salesmen and employees; attracting, selling, and holding customers; and controlling expenses. Some problems which may occur and specific methods for solving them are covered. R.A.S.

PAPER—PHYSICAL PROPERTIES

PRITCHARD, E. J. A study of shrinkage and expansion. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 35, no. 1: 31-8 (February, 1954).

A basic relationship is shown to exist between the shrinkage and water expansion of paper, taking the form of a straightline graph. The slope of the line is an inherent quality of the pulp used; it varies from pulp to pulp. A theory of the mechanisms of shrinkage and water expansion is given. When a sheet of paper is formed, it consists of a mat of fibers swollen with water which also fills the interstices between the fibers. As the sheet is dried in air it shrinks; this shrinkage is brought about by the contraction of the cellulose fibers themselves and the contraction of the entire mass resulting from the surface-tension forces set up between the fibers. These compacting forces operate until further contraction is resisted by the strength of the structure. When the dried sheet of paper is immersed in water it expands, the expansion being caused by the swelling of the cellulose fibers taking up water by imbibition. There is no converse to the action of the surface-tension forces. When the sheet is immersed, the water will fill up the interstices between the fibers, but will have no force to push them apart. Once a bond has been formed by drying, it will not be broken again by immersion in water. It seems to follow that the reversible portion of the shrinkage and the water expansions are due solely to the contraction and swelling of the individual fibers of beaten and unbeaten pulp, whereas the irreversible portion of the shrinkage is due to the contraction of the mat by the surface-tension forces between the fibers. 9 diagrams and 2 references. E.S.

PAPER—SHEET FORMATION

CORTE, HEINZ. Drainage of pulp suspensions through stationary screens. Das Papier 8, no. 11/12: 205-9 (June, 1954). [In German; English and French summaries]

The drainage of pulp suspensions through stationary screens can be described by a simple equation which holds for the first 60-70% of the effluent suspension water. In this range the drainage rate is characterized by a value (the drainage resistance) which is proportional to the half-life period of the drainage. The equation also gives quantitative evidence of the relationship of drainage resistance and concentration, temperature, and beating degree of the pulp suspension; these relationships were confirmed by experiments. Further drainage deviates from the prediction of the equation in that the drainage resistance gradually decreases. The decrease indicates a change in the concentration of the fiber felt and in the flocculation of the suspension and, hence, provides a means for evaluating the uniformity or irregularity of sheet formation. These factors are also influenced by concentration, temperature, and beating degree to the extent that sheet formation is the more uniform, the more rapidly drainage proceeds. The drainage equation was also applied to the moving wire of an experimental paper machine and found to be valid. 8 figures and 6 footnotes. E.S.

PAPER—SHEET SIZES

S. D. WARREN COMPANY. Economical paper sizes. Tappi 37, no. 6: 102A (June, 1954).

If cost is no object, almost any size or shape of paper will produce a printed job; however, to obtain the most mileage per paper dollar, books and pamphlets should be planned in multiples of 8, 16, and 32. A table is included which suggests 12 most efficient sizes which cut with a minimum of waste from standard-size, readily available sheets. 1 table. E.S.

PAPER AND PULP INDUSTRY

ANON. The Austrian paper, pulp (chemical and mechanical), and board industry. Allgem. Papier-Rundschau no. 9: 440-5 (May 5, 1954). [In German]

Conditions in the Austrian pulp and paper industry are reviewed, including statistical data on production, consumption, raw materials, exports, and the German market. 8 tables, 1 diagram, and 2 footnotes. E.S.

ANSTRIN, H. The paper and pulp industry of Switzerland, its development and structure. Svensk Papperstidn. 57, no. 10: 375-7 (May 31, 1954). [In Swedish]

Production, exports and imports, raw materials, hydroelectric power, per capita consumption (58 kg. in 1953), and prices in the Swiss pulp and paper industry are reviewed. E.S.

BOWATER PAPER CORPORATION. *Central Statistical Bureau.* U.K. paper and board industry; 1953 a year of substantial recovery. World's Paper Trade Rev. 141, no. 20: 1606, 1608, 1610, 1612 (May 20, 1954).

Extracts from a review covering British conditions in the pulp and paper industry during 1953 are given. Newsprint capacity, export trends, raw-materials imports, consumption, prices, recovery from the 1952 recession, the growth of overseas production and its influence on British exports, and present demand are discussed briefly. E.S.

MANLEY, LEANDER. Conservation achieved through integration of sawmills and pulp. Pulp Paper Mag. Can. 55, no. 6: 92-5 (May, 1954).

The recent expansion of the pulp and paper industry in British Columbia, an increase from 7 to 13 mills in the past seven years and five more on which construction is expected to commence within the next 18 months, is attributed to the trend toward complete utilization of forest resources. The integration of the waste-utilizing mills with the area's sawmills is hoped to bring a new stability to the forest industries. 1 map and 2 illustrations. R.A.S.

PAPER AND TIMBER (FINLAND). Some features of the development in the Finnish forest industry during 1953. Paper and Timber (Finland) 36, no. 4a: 115-28 (Special issue, April, 1954); Finnish Paper and Timber 5, no. 3: 31-44 (1954). [In English] *cf.* B.I.P.C. 24: 37.

A review is presented of developments in the Finnish forest products industries during 1953 and the early part of 1954 under the following subdivisions: sawmill industry, prefabricated timber house industry, plywood industry, mechanical wood pulp industry, spool industry, chemical wood pulp industry, paper industry, board industry, converted paper and board industry, wallboard industry, special board, and power and steam plants. Each section is introduced with a brief market report for the general period covered by the article. 2 tables and 34 illustrations. E.S.

STEIN, ERWIN. Paper and board in the foreign trade of the Netherlands. Wochbl. Papierfabrik. 82, no. 7: 224, 226-7 (April 15, 1954). [In German]

Statistical data for exports and imports of pulp, paper, and board from and into Holland during recent years are presented. 6 tables. E.S.

TURNER, JOHN S., and STEPHENSON, J. NEWELL. Fifty years with the Canadian pulp and paper industry. Tappi 37, no. 5: 18A, 20A, 22A, 24A, 26A, 28A, 30A, 32A, 34A, 38A, 40A, 42A, 44A, 46A, 48A, 50A, 52A, 54A, 56A, 58A, 60A, 62A, 64A, 66A, 68A; no. 6: 14A, 16A, 18A, 20A, 22A, 24A, 28A, 30A, 32A, 34A, 36A, 38A, 40A, 42A, 44A, 46A, 48A, 50A, 52A (May, June, 1954); *cf.* B.I.P.C. 23: 899; 24: 38, 121, 213, 295.

This is a reprint of the article published in five installments in the *Pulp and Paper Magazine of Canada* under the title: Milestones—1903-1952. 47 illustrations. E.S.

PAPER AND PULP INDUSTRY—EDUCATION

ANON. New life-blood for the industry. World's Paper Trade Rev. 141, no. 19: 1549 (May 13, 1954).

A proposed four-year course in chemical technology to be set up by the Heriot-Watt College in Edinburgh is mentioned; the final year will be devoted to the study of a special subject, and certain paper-machinery-making interests have approached the college authorities that one of these subjects should be papermaking. E.S.

ANON. Paper—a course, a club, a man. Graphic Arts Monthly 26, no. 5: 48, 50, 52 (May, 1954).

The Paper Club of Chicago is an organization composed of graduates of the Paper Selection Course, 16 three-hour sessions sponsored by the Graphic Arts Association of Illinois and taught for seven years by O. H. Runyan; the club holds four meetings a year to provide a medium for the continuous study of new papers, up-to-date production methods, and related subjects. R.A.S.

POPP, RUDOLF. Five years of technical paper instruction in Munich. Allgem. Papier-Rundschau no. 9: 417-20, 422, 424, 426 (May 5, 1954). [In German]

The different technical and practical courses for the papermaking and -converting industries offered by the Oskar-v.-Miller Polytechnikum in Munich are outlined. 2 tables and 5 illustrations. E.S.

POPP, RUDOLF. The road to the title of engineer in paper conversion. Neue Verpackung 7, no. 5: 262-3 (May, 1954). [In German]

Reference is made to a newly established course at the Oskar-von-Miller Polytechnikum in Munich, leading after three years to the degree of engineer in paper conversion. An outline of the required fundamental and practical courses is given. 3 illustrations. E.S.

PAPER AND PULP MILLS

ANON. Colorful history back of Crystal Tissue. Paper & Paper Products 95, no. 23: 12-13 (June 5, 1954).

A brief account is given of the history of Crystal Tissue Co., Middletown, Ohio, which was a sawmill, flourmill, strawboard mill in 1886, a waxed-paper mill in 1894, and began its production of tissue paper in 1920. 1 illustration. R.A.S.

ANON. Donnacona. Tappi 37, no. 6: 114A, 116A, 118A (June, 1954).

The history of the Donnacona Paper Co., now controlled by Howard Smith Paper Mills Ltd., is traced briefly; the company consists of paper, sulfite, and board mills and a well-developed woodlands of 1721 sq. mi. Early history of papermaking in the Donnacona, Que. area dates back to 1817; the original mill of the company was completed in 1914. From a daily capacity of 50 tons of newsprint, the company has expanded to the annual capacity of 105,000 tons of newsprint, 50,000 tons of unbleached sulfite pulp, and 100,000,000 sq. ft. of insulating and sheathing board. R.A.S.

ANON. Farming a forest for paper. Rohm & Haas Reptr. 12, no. 2: 4-9 (March-April, 1954).

A description is given of the integrated operations of Camp Manufacturing Co., Franklin, Va., whose finished products can be classified broadly under the headings of lumber, paper, and chemicals. The Paper Division makes high-grade kraft paper, bleached and unbleached; some of the unbleached kraft is asphalt laminated. The black liquor recovery process, bleach plant, graphic panel board, and paper machines are described. 7 illustrations. R.A.S.

WELDON, R. L. A Canadian visits Pakistan. Pulp Paper Mag. Can. 55, no. 6: 105 (May, 1954); *cf.* B.I.P.C. 24: 695.

Photographs taken by the author when he was the guest of Karnaphuli Paper Co., showing the bamboo cutting operations and the Indian mill, are presented. 6 illustrations. R.A.S.

PAPER MACHINE OPERATION

WRIST, P. E. The papermaking process as a filtration problem. Pulp Paper Mag. Can. 55, no. 6: 115-19 (May, 1954); Paper Mill News 77, no. 24: 50, 52, 55-6, 58 (June 12, 1954).

Drainage on the wire of a Fourdrinier machine is discussed as a problem in filtration. Previous drainage formulas are reviewed and criticized for their neglect of the dynamic aspect of the problem. Equations are derived giving the suction in the nip between the wire and a table roll in terms of machine speed, roll radius, surface tension at the air-water interface, and the vertical height of the wedge of water in the nip. The theoretical equations are shown to agree satisfactorily with measured suctions on a labora-

tory machine designed to simulate conditions present at a table roll of a Fourdrinier machine. Machine speeds up to 550 f.p.m. were investigated. Pulp-filtration resistance is defined and introduced into the drainage formulas. Applications of the theory are discussed in the light of the dependence of drainage/unit area of wire on a machine with parameters of filtration resistance and roll radius. Total filtration resistance is shown to increase in a nonlinear manner with calculated values of basis weight along the machine wire. 5 figures and 13 references. W.L.I.

PAPER SIZING

CASEY, JAMES P. Starch for wet end addition. Tappi 37, no. 6: 152-3A (June, 1954).

The author discusses the complexity of wet-end addition of starch and the need for additional information. Beneficial factors in the application of starch are listed. E.S.

HIDER, W. E. Gelatine and its use in paper sizing. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 35, no. 1: 121-6; discussion: 127-8 (February, 1954).

An outline of the manufacture of hide gelatin is given, including the raw material used, the plant, and the process. The tub sizing with gelatin of handmade and machine-made paper is described. The reasons for tub sizing are discussed, as well as the results obtained by the use of gelatins of different physical properties. 7 references. E.S.

KILLINGER, J. E. Surface sizing of paper and board. Tappi 37, no. 6: 153-6A (June, 1954).

The author discusses the different types of starch products used (enzyme-converted, thin-boiling, and oxidized starches, low-soluble dextrins, chemical condensations, and starch derivatives), locations on the machine where starch is applied (wet end, smoothing press, tub or size press, off-machine, and calenders), and the effects of machine and stock variables on surface sizing. E.S.

PAPER SPECIALTIES

"A. M. B." Recognising papers. Paper Market: 48-9; 78-80, 82 (February, March, 1954); *cf.* B.I.P.C. 24: 563.

This continuation in a series of articles on the wide range of available papers and boards, methods of differentiating between varieties, and possible uses includes descriptions of cover (art, colored, and marble papers), lightweight M.F. (Bible, Oxford India, and Cambridge India), and manila papers. The series concludes with an article summarizing the information necessary in the field of purchasing, including paper sizes (listing N.A.P.M. standards), stock substances, ream counts and a method of calculating, and the organization of the British paper trade. 2 tables. R.A.S.

AMERICAN CAN COMPANY, *New York*. Milk carton output hits new all-time high. Boxboard Containers 72, no. 738: 64 (June, 1954).

A record-breaking volume of 9.7 billion paper milk containers packaged nearly 50% of all beverage milk sold to customers in 1953; this required approximately 325,000 tons of paper and more than 125,000 tons of paraffin. The company is anticipating the continuing trend in greater use of paper milk cartons. R.A.S.

ANON. Hospitals need all-paper service. Paper Sales 14, no. 6: 19-23, 60 (June, 1954); *cf.* B.I.P.C. 24: 822.

The relatively untapped market of the hospital is pointed out as a prospective big user of paper products. Paper items can be used in meal service, for special diet foods, for between-meal nourishments, in isolation sections, and for medical administrations. The reaction of patients served with paper dinnerware at the hospital at Point Pleasant, N.J. is discussed. 8 figures. R.A.S.

ANON. Postwar market developments in paper cups. Am. Paper Merchant 51, no. 6: 26-7, 73 (June, 1954).

The numerous new developments in the use of paper cups are discussed, including dispensers for home use, paper service in hospitals and cafeterias, and special cups developed for beer and hot coffee. 5 illustrations. R.A.S.

ANON. The role of wallpaper. Huber News: 4-11 (Spring, 1954).

The history of wallpaper is traced back to 1481, when Louis XI of France commissioned a painter to execute a design of angels on 50 large rolls of paper. The father of wallpaper is the title bestowed on Jean Baptiste Papillon, a Frenchman who, in 1688, produced papers in a continuous repeating design. The history is sketched up to the present date, which features washable papers pretrimmed and prepasted for easy do-it-yourself application. Production of wallpaper today is described briefly. 24 illustrations. R.A.S.

ANON. Selling the meat markets. Paper & Twine J. 28, no. 4: 9, 28-9 (June, 1954).

Commonly used types of butchers' paper described are butchers' manila, dry-finish butchers' paper, kraft, steam-finished, treated, water-finish, and waxed butchers' papers, meat-interleaving papers, and vegetable parchment. 1 illustration. R.A.S.

DAY, FREDERICK T. Paper conversion and usage. No. 60. Paper garlands and decorations. World's Paper Trade Rev. 141, no. 22: 1760, 1762 (June 3, 1954); *cf.* B.I.P.C. 24: 816.

The methods of manufacturing paper decorations, such as Chinese lanterns, streamers, and seasonal decorative pieces, are described; M.G. sulfite papers, aluminum, gold, and colored metal foils, creped and lined papers, and cellulose films are being used in the production. 1 illustration. R.A.S.

DEL MAR, W. A. The desired electrical qualities of high voltage cable paper. Tappi 37, no. 6: 140-3A (June, 1954).

The author describes briefly the raw materials from which cable papers are made (discarded manila hemp rope and Swedish spruce pulp) and lists the desirable electrical properties of impregnated high-voltage cable papers (high dielectric strength, low permittivity to impose a minimum stress on oil films, and low power factor), as well as the possibilities for imparting these properties to paper. The influence of paper density and thickness and the use of water of controlled conductivity and electrolyte content in the manufacturing process are discussed. 2 references. E.S.

GRUHN, KURT. Requirements of sealable waxed papers. Neue Verpackung 7, no. 5: 241 (May, 1954). [In German]

Wax mixtures for heat-sealing papers should possess good sealing properties and bending strength; a high resistance to cold, water vapor, and aromas; high blocking points; freedom from odors; and a good finish. A paper sold in different weights under the trade name Sealwax meets these requirements. The author emphasizes that a satisfactory heat-seal closure depends not only upon correct sealing, but also upon the subsequent chilling procedure; the latter does not always receive the necessary consideration. E.S.

KING, GERALD. Paper's latest look. Du Pont Mag. 48, no. 3: 20-1 (June-July, 1954); *cf.* B.I.P.C. 22: 18.

Neoprene, Du Pont's chemical rubber, is being used to treat fiber seat covers, filter paper, pressure-sensitive stickers, and paper work caps, imparting improved qualities, particularly increased wet strength. 3 illustrations. R.A.S.

LEWIS, R. L. New developments in converting paper and board. Tappi 37, no. 6: 139A (June, 1954).

The pulp and paper industry is now the fifth largest industry in the country; the development of new products has accounted for a substantial portion of the increased per capita consumption during the past 50 years. A brief review of current developments is given (paper milk bottles, packaging applications, wet-strength papers, etc.). E.S.

MATERN, BRUNO. 25 years of the Perga bottle. Neue Verpackung 7, no. 5: 257-8 (May, 1954). [In German]

Postwar developments in the German paper milk bottle Perga and its increased use in Bavarian cities are discussed. 2 illustrations. E.S.

NATIONAL PAPER TRADE ASSOCIATION. Basic product data about paper cups. Am. Paper Merchant 51, no. 6: 28-9 (June, 1954).

Types of paper cups and variations in round-nesting and the flat or envelope-type cups are described, and information is given on design, print, sizes, packaging, and points to remember in choosing the right cup or container. 1 illustration. R.A.S.

PAPER CUP AND CONTAINER INSTITUTE, INC. *Field Research Division.* Hospitals are adopting paper cups and containers. Paper, Film and Foil Converter 28, no. 5: 23-6; no. 6: 27-30 (May, June, 1954).

The article is a condensation of a booklet prepared by the institute, which is based on the results of a survey on the acceptance of all-paper service in the nation's hospitals; replies from 2215 directors of nursing and chief dieticians are summarized. The main reasons given for the increasing use of paper cups and dishes are economy and efficiency of operation, sanitation, and convenience. Advantages were particularly realized in the case of contagious diseases, specialized diets, and children and mental patients. The comparative costs of serving food in paper containers has not been studied to any great extent, but in one hospital in 1952, experienced accountants estimated the saving at approximately $30,000. 1 table and 11 figures. R.A.S.

RENKER, ARMIN. Connoisseurs' papers. Allgem. Papier-Rundschau no. 9: 434-6, 438 (May 5, 1954). [In German]

The author discusses the use of fine printing papers for bibliophiles and

points out how the individuality of different countries is characterized by the fine papers which they produce. The perusal of a fine-paper sample book arranged by countries will give evidence of this fact. The three contributors to a valuable edition, the papermaker, printer, and bookbinder, should discuss their mutual problems together with the publisher before starting work. Although such an ideal solution will not often be feasible, at least a knowledge of the other party's craft and its limitations and difficulties should exist. The final product will then combine paper and print in a meaningful unit which exhibits the correct intellectual atmosphere. E.S.

PHYSICAL TESTING—PAPER—BASIS WEIGHT

WADDELL, C. S. The use of a betameter for newsprint basis weight control: a preliminary report. Pulp Paper Mag. Can. 55, no. 6: 109-14 (May, 1954).

The author outlines the results and examines the economic advantages of a trial betameter (I) installation on both the wet and dry ends of a newsprint machine for weight control. Operating as a recorder, (I) indicated that weight variations occurred throughout a reel; normal weight fluctuations, on manual control, were shown to be larger than expected. These weight changes often went undetected in the normal inadequate method of sampling. As a controller, (I) helped considerably to eliminate these weight variations; the weight was maintained close to the ideal, even under disturbed conditions which caused trouble to adjacent machines. Economic advantages were produced by automatic weight control, although exact values could not be determined because of their intangible nature. Paper-weight uniformity was definitely improved by automatic control. Although not evident as yet, better press performance and greater customer satisfaction is expected. 5 figures and 4 references. E.S.

PHYSICAL TESTING—PAPER—BURSTING STRENGTH

LHOMME, H. Bursting strength tests. Papeterie 76, no. 5: 301, 303-4 (May, 1954). [In French]

The bursting strength of paper is discussed with special reference to the significance of the bulge (the altitude of deformation caused in a paper sample under the pressure exerted by the diaphragm in making the burst test). Its usefulness in testing certain specialty papers which in practice are submitted to deformation is emphasized. The relationship between burst and tensile strength is discussed briefly. 2 tables and 2 figures. L.E.W.

PHYSICAL TESTING—PAPER—GLOSS

BRENNER, BERTHOLD. Note on gloss measurement and tolerance of photographic paper. J. Opt. Soc. Amer. 44, no. 6: 494-6 (June, 1954).

A study on the gloss of photographic paper was made to determine: (1) whether the gloss measured at an angle of 75° or that measured at some smaller angle would correlate best with visual judgments of glossiness, and (2) to evaluate "just noticeable differences" in glossiness as a basis for assigning tolerances in gloss specifications. The glossiness ranking of photographic paper samples by 22 observers was found to have a slightly higher correlation with gloss measurements at 22.5 and 45 than at 75°. The magnitude of a usually just noticeable gloss difference was determined. 2 tables, 1 figure, and 6 references. W.A.W.

HOPKINS, L. F., and HIGHTON, A. P. A new gloss meter incorporating a method for accurately measuring the polarization of light. Nature 173, no. 4414: 1088-9 (June 5, 1954).

A preliminary report is given of a prototype gloss meter which is a modification of the Ingersoll Glarimeter type of instrument. The instrument involves a phototube null balance circuit which avoids the operational difficulties of visual photometry occurring with the older Ingersoll meter. 1 figure and 1 reference. A.L.L.

PHYSICAL TESTING—PAPER—PICK RESISTANCE

ANON. How to use the LTF pick tester. Am. Pressman 64, no. 7: 22-5 (June, 1954); *cf.* B.I.P.C. 22: 847.

Directions are given for using the LTF pick tester, a machine developed by the Lithographic Technical Foundation to test the pick resistance of offset papers. The necessary materials are listed, and steps of setting up the instrument, applying the blanket, preparing for the test, making the test, and determining the test results are outlined. Standard temperature and R.H. conditions are established; the need for proper clean-up procedures is emphasized. The pick tester can be used for letterpress paper, but tests have not been evaluated to guarantee their reliability. 9 illustrations. R.A.S.

ANON. The pick test. Am. Printer 135, no. 6: 76-7 (June, 1954).

The wax test for determining the resistance of paper to pick is described. 2 illustrations. R.A.S.

PHYSICAL TESTING—PAPER—PRINTABILITY

HULL, H. H., and ROGERS, M. C. New methods for observing properties of paper which influence printability. Intern. Bull. for the Printing and Allied Trades no. 68: 12-13, 21-3 (April, 1954).

New methods of paper testing for printability are described which are modifications of drawdown techniques familiar to printing-ink manufacturers. These tests are rapid, not complicated, and suitable for control work; they demonstrate the complexity of the paper surface and explain that one test alone cannot be expected to characterize the printability of a paper and that small-area samplings of paper may lead to erroneous conclusions. The following methods (primarily developed by comparing coated papers) are covered: the rigid-blade drawdown which indicates paper formation and caliper variation; the flexible-blade drawdown which characterizes the coating surface; and wipe tests which are essentially absorption measurements giving an indication of the fine character of the coating surface. The individual tests are described in detail, and their significance and interpretation are discussed. The authors claim that the classification of paper-surface contour by drawdown techniques offers printers and papermakers a means for estimating printability in agreement with pressroom performance. 1 table, 7 figures, and 4 references. E.S.

MONROY, J. F. Studies on the suitability of papers to be used in printing. Assoc. tech. ind. papetière, Bull. no. 3: 75-83 (1954). [In French]

The author discusses the penetration of liquids into papers and the printability of paper, including such problems as dusting, picking, and offsetting, the surface structure of paper, and the reproducibility of halftones. Instruments developed at the Instituut voor Grafische Techniek, Amsterdam and

used in these tests (a dusting tester and the I.G.T. printability tester) are described and illustrated. 18 figures and 11 references. L.E.W.

PHYSICAL TESTING—PAPER—WET STRENGTH

DURGIN, A. G., and BAKER, W. G. A mill control method for wet-strength papers. Tappi 37, no. 6: 217-18A (June, 1954).

The development is described of a control method for measuring the wet burst of paper, which is sufficiently rapid to detect variations in quality and allow corrections to be made on the machine as soon as possible after the paper has been manufactured. Four sample sheets, 12 × 18 inches, are taken from the front, center, and back of each reel, and the basis weight is determined. One sheet (I) is kept for the quick wet-burst test, and the remainder is sent to the laboratory for testing by the standard procedure. (I) is submerged in a soaking bath maintained at 45 ± 2°C. for 30 minutes, removed, and tested immediately without blotting on a standard Mullen tester. Ten tests are taken around the periphery of the sample, five from the wire and five from the felt side. The average wet burst (II) is determined by averaging these tests. The percentage of wet burst is obtained by application to (II) of a formula and conversion factor (the average of a large number of individual tests) for each grade. 3 figures. E.S.

PLASTIC FILMS—TESTING

FREEMAN, A. J., SHERIDAN, L. W., and RENFREW, M. M. Plastic films at low temperatures. Modern Packaging 27, no. 10: 147-51, 216, 218 (June, 1954).

Experiments in the development of giant plastic balloons for probing the stratosphere are discussed; tests are described and data presented on the low-temperature toughness (brittleness and resistance to tearing or puncture), gas permeability and porosity, and the effect of flexing of plastic films. In the toughness tests differentiation was made between polyethylene films, polyethylene-polyisobutylene blends, polychlorotrifluoroethylene (Kel-F or Trithene), polytetrafluoroethylene (Teflon), Mylar (I) (a condensation product of ethylene glycol and terephthalic acid), special laminates, and irradiated polyethylene. The following generalizations were made: high-intensity irradiation increases low-temperature and room-temperature puncture and tear strength up to 20%, tensile strength also is increased 10-20%, and the cold-brittleness temperature is not lowered markedly. Permeability information is presented on (I), which has been attractive for potential balloon fabrication partly because of its very low gas permeability. 8 tables, 4 figures, and 6 references. R.A.S.

SLONE, MURRAY C., and REINHART, FRANK W. Properties of plastics films. Modern Plastics 31, no. 10: 203-4, 206, 208, 212, 215-16, 218, 223-4, 226, 380 (June, 1954); Packaging Parade 22, no. 258: 22-3, 57 (July, 1954).

The properties of 13 varieties of commercially available plastic films (cellophane, cellulose acetate, cellulose acetate butyrate, cellulose triacetate, ethylcellulose, polyethylene, polystyrene, polyester, saran, polyvinyl alcohol, polyvinyl chloride, polyvinyl chloride-saran laminate, and polymethyl methacrylate) in different thicknesses were measured. The results of tests to determine tensile strength, tear, folding endurance, water absorption, water-vapor permeability, low-temperature impact, change in linear dimensions on heating, specific gravity, and flammability properties are summarized. These results indicate the range of properties available for various types of films

and the limitations of some of the test procedures commonly used; the system employed in sampling the specimens is outlined. 12 tables, 12 figures, and 4 references. R.A.S.

PLASTIC FILMS (NONCELLULOSIC)

LANNING, D. D. Mylar polyester film and the converter. Paper, Film and Foil Converter 28, no. 6: 20-6 (June, 1954).

Detailed information is presented on the properties and applications of Mylar, a polyester film produced by the Du Pont Co. from the condensation of ethylene glycol and terephthalic acid. Converter operations include slitting the film in widths less than ½ inch, laminating, printing, and vacuum metallizing; it is unnecessary to apply varnish or lacquer coatings, since the film itself offers a solid barrier to chemical and electrical attack. Definite advantages of the film are an extremely high tensile strength, high tensile modulus, good flex tear properties, and low moisture absorption. One problem which remains to be solved before general packaging with Mylar becomes a reality is that of finding an easy method of heat sealing, although electronic sealing is possible. 4 tables and 13 figures. R.A.S.

PLASTICS

HAGBARTH, OP. Polyethylene as a chemical construction material. Svensk Papperstidn. 57, no. 9: 335-9 (May 15, 1954). [In Swedish]

The structure, physical properties, resistance to chemicals, workability, and possible applications as a chemical construction material of polyethylene are discussed. 1 table and 14 figures. E.S.

JAHN, E. C., and STANNETT, V. Plastics-paper combinations. Svensk Papperstidn. 57, no. 9: 331-4 (May 15, 1954). [In Swedish; English and German summaries] *cf.* B.I.P.C. 22: 39.

Developments in methods of application of plastics to paper, types of paper-plastics combinations, and future trends are reviewed. Essentially the same information as in the previous reference is given, although it is somewhat extended and brought up to date. 5 tables and 2 references. E.S.

POLYMERIZATION

MARTIN, GÉRARD. Macromolecules. Papeterie 76, no. 5: 277, 279, 281, 283, 285, 287 (May, 1954). [In French]

A very general discussion of the structure of macromolecular substances is presented. 6 figures. L.E.W.

PRINTING—EDUCATION

ESCHENBACH, W. The Darmstadt graduate school and printing problems of the packaging industry. Neue Verpackung 7, no. 5: 242 (May, 1954). [In German]

The principal objectives of the new institute for printing machinery and processes affiliated with the paper institute at Darmstadt are the training of engineers for the construction and development of new machinery and the technical management of large printing works and the carrying out of research. The author reviews printing problems presented by the packaging industry. E.S.

PRINTING AND PRINTER'S INK

ANON. The printing of aluminum foils. Neue Verpackung 7, no. 5: 250-3 (May, 1954). [In German]

The suitability of letterpress, flexography, and intaglio printing for aluminum foils in the packaging industry are discussed. 3 illustrations. E.S.

F. H. Practical printing problems in the packaging industry. Neue Verpackung 7, no. 5: 243-5 (May, 1954). [In German]

The possibilities and limitations of letterpress, dry offset, flexography, hot embossing, offset, and intaglio for packaging materials are discussed. 7 illustrations. E.S.

KÜHN, WALTHER. Intaglio printing in the packaging industry. Verpackungs Rundschau no. 5: 231-5 (May, 1954). [In German]

German intaglio printing machines and their use for metal foils, parchment paper, glassine paper, and transparent cellulosic and noncellulosic plastic films in the packaging industry are reviewed. 4 illustrations. E.S.

PRODUCTIVITY

MAYNARD, C. R. G. Some notes on a tour of the American paper industry. Paper-Maker (London) 127, no. 5: 382, 384, 386 (May, 1954); Paper Market: 192, 194, 196 (June, 1954).

The recipient of an award of a technical assistance project of the Mutual Security Agency to achieve a working knowledge of the techniques and developments in the U. S. paper industry, the author first outlines his one-year program, a combination of academic work and practical training with industrial firms. The principal topic of the article is a discussion of the reasons for the higher productivity in the United States as compared with British conditions. Four estimates of productivity are presented based on: (1) the ratio of paper prices to wages; (2) the direct measurement of man-hours/ton; (3) observation of machine speeds; and (4) net output/worker/year. With regard to quality, it is probable that in many cases the British pay too much attention to the inessential qualities of paper and not sufficient attention to those which are essential to the performance of its job. Among the reasons for the observed differences in productivity of the two countries are listed: the greater competitiveness of the U. S. paper industry, the higher efficiency of its management team which is more measurement conscious, the better supervision and organization of the American worker (who does not work harder than his British counterpart, but has more machinery available to help him), better machinery-replacement policies, a higher supply of highly qualified technologists, a greater mobility of technical staffs with much less trade secrecy, and the favoring of productivity by the general public opinion. 5 references. E.S.

PAPER INDUSTRY. A focus issue—to increased productivity through successful operation of equipment and processes. Paper Ind. 36, no. 2: 137-64 (May, 1954).

Almost the entire issue is devoted to methods of increasing productivity in pulp and paper mills; the question is raised whether or not the industry has fully achieved the anticipated productivity that was to justify the huge expenditures of the last decade on new equipment and production facilities. This summary includes discussions mainly concerned with the qualitative evaluation of the factors of equipment and raw materials utilization and

technological development. The individual articles are presented by authors and titles: Dyck, A. W. J. Are we operating at maximum productivity?, p. 137-8; Sproull, Reavis C. Increased productivity by integration—1 table, 3 diagrams, and 4 references, p. 139-40; Anon. Woodyard operations—3 illustrations, p. 141-2; Anon. Barking and chipping operations—1 illustration, p. 142-3; Anon. Groundwood pulping—2 illustrations, p. 144; Anon. Sulfite pulping—3 illustrations, p. 144-6; Anon. Semichemical pulping—2 figures, p. 146-7, 155; Nolan, W. J. Increasing quality and production in high yield kraft and semichemical pulps—1 table and 1 reference, p. 148-9; McGregor, George H. Increasing quality and production in sulfite pulping—2 tables, p. 150-1; Anon. Liquor and by-products recovery—1 flowsheet, p. 152-3; Anon. Pulp refining and stock preparation—7 illustrations, p. 153-5; Anon. The paper machine—5 illustrations, p. 156-8; Anon. Air supply systems for drying and ventilation—2 illustrations, p. 159; Anon. Instrumentation—8 figures, p. 160-3; and Anon. Well-planned and streamlined handling of products results in increased productivity—6 illustrations, p. 164. R.A.S.

PULP STONES

ANON. Norton completes 'guinea pig' pulpstone. Paper Mill News 77, no. 26: 17 (June 26, 1954); Southern Pulp Paper Mfr. 17, no. 7: 34 (July, 1954).

A test pulpstone developed by Norton Co. with numerous electrical gages distributed throughout its structure and connected with wires to the recording panel and other instruments will be installed at the Millinocket, Maine mill of the Great Northern Paper Co. The construction was designed to disclose stresses, temperature variations, and other factors throughout all parts of the pulpstone during actual pulp-grinding operations in a mill. 1 illustration. R.A.S.

PULP WASHING

HUSEBY, HAROLD H. The maintenance of bleach plant equipment. Tappi 37, no. 6: 253-5 (June, 1954).

The treatment of several problems in handling chlorine is discussed, along with those problems encountered in maintaining facing on vacuum washers. Ventilation and the elimination of corrosive gases and moisture posed a question, and the answers were found in hoods placed directly on each washer. Other maintenance problems are also discussed. 2 illustrations. E.S.

RADIO

ANON. Logging by radio. Paper Ind. 36, no. 3: 298 (June, 1954).

The Southern Oregon Conservation and Tree Farm Association operates a radio station for two-way contact with some 60 mobile units located in cars, pickup trucks, and logging camps of the member firms. Association officials point out that the cost/mile of the radio communication is about 25% of the cost of constructing a telephone line. 1 illustration. R.A.S.

RAW MATERIALS

VOLLE, —. Tropical wood, bagasse, bamboo or straw and sunflower stalks and the like? Wochbl. Papierfabrik. 82, no. 6: 184-5 (March 31, 1954). [In German]

The possibilities of covering at least part of the European fibrous raw-materials requirements with straw and sunflower stalks are emphasized. E.S.

RAYON—VISCOSE PROCESS

SAMUELSON, OLOF, ANDERSSON, ROLAND H., AND GÄRTNER, FRED. Emulsion xanthation of cellulose. Part VI. Influence of cold alkali treatment of cotton linters and wood pulp upon emulsion xanthation. Tappi 37, no. 6: 236-42 (June, 1954); *cf.* B.I.P.C. 22: 199-200.

Previous papers in this series showed that there were differences in the behavior of a normal viscose pulp and a cold alkali-refined (mercerized) pulp during emulsion xanthation. In this paper, the authors are concerned with a detailed study of the influence of cold-alkali treatment upon the dissolution of cotton linters and wood pulp during emulsion xanthation. The amount of undissolved residue after emulsion xanthation is unchanged as long as the sodium hydroxide concentration in the cold-alkali treatment does not exceed 12%. No change in the D.S. of the undissolved residue was detected. When the sodium hydroxide concentration exceeds 12%, the undissolved residue decreases, the lowest value being at 16% caustic. The D.S. increases as the concentration is increased to 20%. Washing conditions after mercerization are of importance. Treatment with sodium chloride solution directly after mercerization with 25% sodium hydroxide at 20°C. results in a better dissolution throughout the whole range of sodium hydroxide concentrations. Drying at elevated temperatures has a more marked influence on wood pulp than on cotton linters. In general, elevated temperature during drying has a detrimental effect on dissolution. The D.S. of the residue increases on repeated treatment with sodium hydroxide and carbon disulfide, and there is a marked difference between the behavior of cotton linters and wood pulp. 5 tables, 9 figures, and 12 references. E.S.

RESEARCH

KOROLEFF, A. Research to increase logging efficiency. Unasylva 7, no. 4: 155-7 (December, 1953).

The possibilities offered by research devoted to the promotion of logging efficiency are discussed; two main fields of this research are improvements of logging practice by a better choice and use of the available means and methods of logging and the adoption of new considerably more efficient equipment and methods in place of those now employed. 2 references. R.A.S.

RESEARCH LABORATORIES

JENSEN, WALDEMAR. The activity in 1953-54 at the Institute of Wood Chemistry of the University of Åbo Akademi. Paper and Timber (Finland) 36, no. 4a: 175-6 (Special issue, April, 1954). [In Swedish; English summary] *cf.* B.I.P.C. 24: 50.

Research, particularly on the chemistry of birch bark and the use of birchwood for pulping, new equipment, a new course in textile dyeing, and participation in scientific meetings are reviewed. 4 illustrations. E.S.

NEUHÄUSSER, R. Corrugated board as object for research. Neue Verpackung 7, no. 5: 202 (May, 1954). [In German]

The Verband der Wellpappenindustrie has recently established a research center at Offenbach a.M. in Germany. The activities of the new center (routine testing, special testing, and investigations covering the manufacture, conversion, and shipping applications of corrugated board) are reviewed briefly. E.S.

RESIN, SYNTHETIC—IDENTIFICATION

HOUSE, R. R., and WOODBERRY, N. T. Identification of wet-strength resins in paper by a dye staining technique. Tappi 37, no. 6: 255-7 + 1 insert (June, 1954).

Because of the increased use of wet-strength resins in the paper industry during the past 10 years, it has become important to have a quick and accurate means of identification for these resin-treated papers. Several years ago a dye-staining technique was developed (*cf.* B.I.P.C. 15: 356), the use of which made it possible to identify most wet-strength papers. Recently, however, new types of urea resins have become commercially available and it was found necessary to modify the dye-staining test to cover these resins. A blue acid dye is employed which is selectively adsorbed by the various resins (urea and melamine) and various protein materials (glue, casein, etc.) which may be found in wet-strength papers. By use of several pretreatments and dyeing procedures, it is possible to positively identify paper treated with a melamine resin. The test may also be used to identify some types of urea resins, although supplementary tests may be necessary to help differentiate between other types of urea resins and protein materials. 1 table, 1 color chart, and 2 references. E.S.

ROOFING FELTS

SCHMIDT, H. The high demands placed on roofing felts. Wochbl. Papierfabrik. 82, no. 7: 215-16 (April 15, 1954). [In German]

Following the passage through an impregnating bath of tar, asphalt, etc. at 180°C., the roofing felts are pressed between rolls to remove about 50% of the impregnating agent. This pressing is usually carried out between a single pair of press rolls, irrespective of felt thickness, increased machine speeds, etc. No boardmaker would attempt the dewatering of ordinary board in a single press; usually three or four pairs of press rolls are employed. The author shows the inevitable drawbacks of this forced pressing on the resulting roofing paper and emphasizes the need for an additional pair of press rolls of sufficient diameter after the impregnating bath. The much complained-of lowered quality of present roofing felts will be found greatly improved after such an installation. E.S.

RUBBER

WALSH, A. The use of rubber in the paper trade. World's Paper Trade Rev. 141, no. 19: 1505-6, 1508, 1510 (May 13, 1954).

Paper-industry applications of natural and synthetic rubber are discussed, including antivibration foundation mats, rubber-lined vessels for the storage of pulp and alum and for pulp beaters, linings of trunnion filters, rubber-covered rolls (breast roll, table rolls, suction couch and press rolls, smoothing-press rolls, felt-spreader rolls, etc.), and auxiliary items, such as V-belts, deckle straps, flexible drives, instrument mountings, and the like. 2 tables and 3 illustrations. E.S.

SAFETY

COLLAR, ELMER. What an hourly worker expects of a safety program. Tappi 37, no. 6: 223-4A (June, 1954).

The importance of the participation of the hourly-paid worker in promoting and discussing a safety program is emphasized. R.A.S.

ROBERTSON, LOGAN T. Organization of an industrial medical

program. Southern Pulp Paper Mfr. 17, no. 6: 44, 46 (June, 1954).

The scope and objectives (complete medical and surgical care, prevention of disease or injury, and education about healthful living), cost, and economic and other benefits of an industrial medical program are outlined. R.A.S.

SEMI-CHEMICAL PULPING PROCESS

FIEDLER, —. Semichemical pulps for the manufacture of fine papers. Allgem. Papier-Rundschau no. 9: 462, 464, 467-8, 470 (May 5, 1954). [In German]

A review of recent developments in semichemical pulping in the United States is presented, with particular reference to the utilization of hardwoods and the neutral sulfite semichemical process. 2 tables and 6 references. E.S.

ZIMMERMAN, W. J. Neutral sulphite semi-chemical process; developments in pulping hardwoods. World's Paper Trade Rev. 141, no. 21: 1678, 1680 (May 27, 1954).

The advantages of the N.S.S.C. pulping method, particularly for hardwoods such as poplar and birch, are briefly outlined. The properties of bleached and unbleached pulps are discussed. E.S.

SHIPPING CONTAINERS

ANON. Single container replaces five drums. Boxboard Containers 72, no. 738: 65 (June, 1954); Packaging Parade 22, no. 257: 95 (June, 1954).

The corrugated fiber container developed by Gaylord Container Corp. for Dow Chemical Co., Midland, Mich. for making 1000-pound shipments of Styron plastic pellets comprises inner and outer bodies of 700-pound test, double-wall board and telescoping bottom and top lids of scuff- and moisture-resistant, 500-pound test, single-wall board. When the box is filled and capped, it is steel strapped in two directions to an expendable wood skid. 1 illustration in the first reference and 2 in the second. R.A.S.

MEZGER, HEINRICH. The stabilizing factors in folding boxes. Neue Verpackung 7, no. 5: 260 (May, 1954); *cf.* B.I.P.C. 24: 830.

Folding boxes may be stiffened by laminating a strong kraft paper to the boxboard; corrugated boxes made from board with low corrugations possess a much better strength than those made with high corrugations. The correct fabrication of the box, particularly the closing of the flaps by taping, stitching, or gluing, or a combination of these methods when high stresses have to be met, will materially contribute to box strength. Patented tools for stitching filled boxes are illustrated. 3 figures. E.S.

STERLING OPTICAL COMPANY, *New York*. Box within a box. Modern Packaging 27, no. 10: 99 (June, 1954).

A one-piece mailer designed to package eye glasses in their case comprises an outer container and inner liner of corrugated board which forms double or triple walls throughout. 2 illustrations. R.A.S.

SHIPPING CONTAINERS—PALLETIZING

ANON. No-block pallets. Modern Packaging 27, no. 10: 142-4 (June, 1954).

The Ternstedt Division of General Motors Corp. at Trenton, N.J. has replaced five sizes of block-style pallets with one blockless pallet, measuring 41 by 35 inches and made of eight 1-inch timbers, for use in handling hardware accessories for cars. The change has resulted in savings in pallet and shipping costs and reduction in warehouse space for loaded and unloaded pallets; some of the interior packing used by the company is illustrated. 9 illustrations. R.A.S.

SHIPPING CONTAINERS—TESTING

BORKENHAGEN, E. H. Fibre cans for ordnance—I and II. Modern Packaging 27, no. 9: 159-62, 241-2; no. 10: 152-5 (May, June, 1954).

The results of a one-year testing program conducted by the Forest Products Laboratory, Madison, Wis. and the Ordnance Packaging Office at the Rossford Ordnance Depot, Toledo, on the use of metal-end fiber tubes in military packaging are presented. Various constructions, test loads and materials, test procedures, and analysis of results are given separately for the two independent studies—the first series covering the evaluation of the adequacy of spirally wound fiber cans with metal ends which used an aluminum foil-kraft laminated ply as a barrier and the second series testing the performance of four different constructions of spirally wound fiber cans with metal ends which used a "free foil" type of barrier. The fiber cans tested in the first series were not adequate in providing a barrier against the transmission of water vapor; the free aluminum foil in the second test gave adequate protection as long as the foil layer was located near the outer surface of the fiber wall. The top-to-bottom compressive strength varied inversely with the temperature at which the fiber tubes were conditioned and tested. As a result of these tests, Military Specification MIL-B-12147A (ORD) was developed. 9 tables and 11 illustrations. R.A.S.

BROWN, FRANK A., HAYHURST, L. J., and KAUFMAN, C. W. A practical control program for shipping containers. Food Technol. 8, no. 1: 29-32 (January, 1954).

The quality-control program of the Kraft Foods Co. Research Laboratories, Glenview, Ill. for evaluating different shipments of containers is described, including a list of equipment required (a Mullen bursting-strength tester with manifold and two gages, a caliper device, and a steel tape measure at each of eight major locations), routine test procedures to guarantee compliance with specifications, and tests to determine minimum protection requirements. 7 illustrations of defective containers. R.A.S.

FOOD ENGINEERING. Checking packaging supplies. Food Eng. 26, no. 6: 45-6 (June, 1954).

Working details on checking the adherence of plain cartons, display cartons, and shipping cases to specifications; gluing, printing, and board stock requirements; and methods for examining shipping cases and looking for defects are discussed. 1 illustration. R.A.S.

HEISS, R. Packaging material and shipping container. Verpackungs Rundschau no. 5: 239-44 (May, 1954). [In German]

This is a summary of the work carried out at the Forest Products Lab-

oratory at Madison, Wis., notably by Kellicutt and co-workers, for establishing the relationships between the mechanical properties of the component fiberboards and the strength (safe stacking life) of the finished corrugated shipping container (*cf.* B.I.P.C. 21: 684-5; 22: 202-3, 357; 23: 126, 579). 1 table, 10 figures, and 6 references. E.S.

MORGAN, H. E. Nomograph aids analysis of box failure. Fibre Containers 39, no. 5: 68, 70 (May, 1954).

The degree of shock causing damage to a packaged product in transit is measured by an impact recorder, preferably a three-directional machine with three styluses recording simultaneously. The markings made by two or three of the units, incorporated in a single case and caused by a single impact, can be added to give the magnitude and direction of the impact. A method of finding the total impact by the use of a vector nomograph is outlined. 2 figures. R.A.S.

RIDDELL, G. L. The quality of paper and board in relation to its usage—packaging. World's Paper Trade Rev. 141, no. 20: 1589-94, 1596, 1598, 1603 (May 20, 1954); Paper & Print 27, no. 2: 166-7, 169-71, 173 (Summer, 1954).

A package has to perform one or several of the following functions: it has to contain the product without detriment to the product or the package; it may have to give protection to the contents against mechanical damage arising from blows, crushing, or vibration; and it may have to give protection against the ingress or egress of water, water vapor, and gases. To assess the performance of packages, laboratory tests can be carried out on the package and the packaging materials; the former include such tests as the drum, impact, compression, and vibration strength tests and resistance to water and water-vapor penetration. The corresponding properties of the materials from which the package is made can also be evaluated in the laboratory; in some instances it has been found that strength tests performed under dynamic conditions give better correlation than the more usual static tests. In all laboratory testing of either packages or their components, correlation between laboratory tests and practical performance must be sought. Throughout the article the author stresses the fact that package testing is still in its infancy and that the results must be interpreted with caution and supported by field trials where necessary. 1 table, 9 figures, and 8 references. E.S.

SLIME PREVENTION

PAPER MILL NEWS. Slime control number. Paper Mill News 77, no. 25: 10-12, 14-16 (June 19, 1954).

Different suppliers of slimicides discuss their products in the following short articles: Nilson, Robert. Good housekeeping: an answer to pitch & slime control (Oakite Composition No. 45), p. 10; Buckman Laboratories, Inc. Industrial microorganism control; mine to user (description of mercury mine in California)—7 illustrations, p. 11, 16; R. T. Vanderbilt Company. Screening tests with Merfenel 51, p. 12; Gallowhur Chemical Corporation. Slimicides for paper mills (Puratized PMA and SC, Gallicide, Mersynate, and Gallosan), p. 14; Stecker Chemicals, Inc. Stecker introduces Quicksan series, p. 14; Sanborn, J. R. Slime control plus dispersing action offered in new Nalco formula (Nalco 234), p. 15; and W. A. Cleary Corporation. Cleary introduces nontoxic No-Slyme, p. 15. E.S.

PATTE, W. E. Current practices of slime control; a report to the 1953 Testing and Control Committee, Technical Section,

C.P.P.A. Pulp Paper Mag. Can. 55, no. 6: 120-4 (May, 1954); Paper Mill News 77, no. 25: 20 (June 19, 1954). [Abridgment]

A summary of the replies to the (second) slime control questionnaire issued in 1953 by the Testing and Control Committee is presented under the three headings: slime susceptibility (mill type, sources of infection, seasonal effects, lining materials, system temperatures, fresh-water consumption, and pitch treatment); resultant slime effects (points of troublesome slime, washups, slime properties, slimicide hazards, and economic losses); and slime control measures (detection methods, fresh-water treatment, slimicides used, and slimicide selection). Suggestions for the utilization of the data obtained through a questionnaire and for the improvement of questionnaire techniques are included. In an appendix, the original questionnaire issued in 1947 with the total number of mills replying to each question is reprinted. E.S.

SORBIC ACID

INSTITUTE OF FOOD TECHNOLOGISTS. Sorbic acid as a fungistatic agent for foods. Food Research 19, no. 1: 1-65 (January-February, 1954); Food Technol. 8, no. 3: 133-5 (March, 1954); *cf.* B.I.P.C. 24: 385.

A series of articles on the use of sorbic acid as a fungistatic agent in foods, given at the Boston meeting of the institute on June 22-24, 1953, are presented under the following authors and titles: Deuel, Harry J., Jr., Alfin-Slater, Roslyn, Weil, Carrol S., and Smyth, Henry F., Jr. Harmlessness of sorbic acid as a dietary component—8 tables and 20 references, p. 1-12; Deuel, Harry J., Jr., Calbert, Clarence E., Anisfeld, Lilla, McKeehan, Harry, and Blunden, Harry D. Metabolism of α,β-unsaturated fatty acids with emphasis on sorbic acid—3 tables and 18 references, p. 13-19; Melnick, Daniel, and Luckmann, Frederick H. Spectrophotometric determination of sorbic acid in cheese and in cheese wrappers—2 tables, 3 diagrams, and 6 references, p. 20-7; Melnick, Daniel, and Luckmann, Frederick H. Migration of sorbic acid from wrapper into cheese—2 tables and 4 references, p. 28-32; Melnick, Daniel, Luckmann, Frederick H., and Gooding, Chester M. Resistance of sorbic acid in cheese to oxidative deterioration—4 tables, 2 diagrams, and 25 references, p. 33-43; Melnick, Daniel, Luckmann, Frederick H., and Gooding, Chester M. Metabolic degradation of sorbic acid in cheese by molds and the mechanism of mold inhibition—5 tables, 3 figures, and 25 references, p. 44-58; Smith, Donald P., and Rollin, Norbert J. Effectiveness of sorbic acid in protecting cheese—4 tables and 11 references, p. 59-65; and in the second magazine reference, Smith, Donald P., and Rollin, Norbert J. Need and efficacy in protecting packaged cheese—1 table and 12 references, p. 133-5. R.A.S.

SPENT SEMICHEMICAL LIQUOR

GAMBLE, S. J. R., and BUTLER, R. G. The soil perfusion technique for the biological degradation of sulfite waste liquor. Appl. Microbiol. 1, no. 2: 96-7 (March, 1953).

A perfusion method is described for enriching the soil with microorganisms utilizing semichemical neutral spent sulfite liquor, thereby lowering the B.O.D. of this waste. Rod-type bacteria were predominantly present after perfusion of the soil; no attempt was made to identify them. 3 tables and 2 references. E.S.

STARCH

BLOM, JAKOB, and SCHWARZ, BIRGIT. The difference in the linkages of potato starch which may be split by amylases. Acta

Chem. Scand. 8, no. 3: 407-11 (1954). [In German] *cf.* B.I.P.C. 23: 126.

The degradation of potato-starch pastes by pancreas, subtilis, and malt amylases was followed by changes in rotation and reducing values. The change in rotation/mole of split linkages was found to differ for the different amylases and to depend upon the degree of degradation. The authors explain this result by the assumption that starch contains different types of linkages which may be cleaved by amylases. 1 table, 3 figures, and 6 references. E.S.

WHITE, T. A. Starches tailor-made for the paper industry. Tappi 37, no. 6: 156-8A (June, 1954).

The author discusses the industrial raw starches (corn, tapioca, potato, waxy maize, wheat, and sago) and industrial modifications (thin-boiling and oxidized starches, dextrins, enzyme-converted starches, esterified and etherified starches, and other derivates). Pure amylose-type starches are being developed but are not yet available. 1 table. E.S.

STATISTICAL METHODS

HENDRY, I. F. Statistics in paper making; general introduction and elementary theory. Paper-Maker (London) 127, no. 5: 388, 390-1, 395 (May, 1954).

The article is the first one in a series in which the advantages of the use of statistics in the paper industry are shown. The variability of paper is discussed and its extent is illustrated by means of three examples (variations in substance in machine and cross-machine directions and in burst); the preparation of histograms for this purpose is outlined. The use of elementary statistics, going from the mean to the standard deviation, is advocated. 3 diagrams and 3 references. E.S.

STEAM POWER

KORTEN, E. C. The ASME boiler and pressure vessel code and its application in the United States and Canada. Tappi 37, no. 6: 242-9 (June, 1954).

The author presents an exposition of the organization and function of the ASME Boiler Code Committee with a brief outline of some of the reasons for its existence. He explains the interrelationship of the Code Committee, the enforcement authority, the inspecting agency, the manufacturer, and the user of boilers and pressure vessels. Facts which the user needs to know about actual application of the Code in the United States and Canada are related; some of the more common pitfalls encountered in trying to obtain pressure-carrying equipment complying with the Code and legal requirements are pointed out. Ways of obtaining such equipment with a minimum of friction and misunderstanding are discussed. 1 table, 8 figures, and 3 references. E.S.

WALTER, LEO. Mechanical purification and sampling of exhaust steam. Indian Pulp and Paper 8, no. 8: 384-6 (February, 1954).

Directions for assembling efficient separators for steam and lubricating oil are given. 6 illustrations. E.S.

STEAM TURBINES

ANON. Power for paper making. Paper Making 73, no. 1: vi-vii (Spring, 1954).

A brief description is given of a new turbo-alternator set which has recently been supplied by The General Electric Co. Ltd. for the Carrongrove Paper Co.'s mill near Denny in Scotland. The set consists of a combined pressure and bleeder-type condensing turbine which is direct-coupled to a 3500 kw. alternator and exciter. Provision has been made in the turbine designed for conversion to higher steam-pressure and temperature conditions, should the present boilers be replaced in the future. 3 figures. E.S.

STOCK PREPARATION

MORDEN MACHINE COMPANY. Fundamentals of stock preparation—Morden-ized. Paper Mill News 77, no. 20: 106-7 (May 15, 1954).

The individual action of three basic Morden stock-preparation machines, the Stock-maker, the Stuff-maker, and the Slush-maker, and proportioned treatment obtainable through their combination are briefly outlined. 8 figures and 1 reference. E.S.

WHITE, W. A., JR. The concept of balanced treatment of pulp and operation of Hydrafiners and jordans. Paper Mill News 77, no. 20: 88-90, 92, 94-6, 98, 100, 102-3, 105 (May 15, 1954); *cf.* B.I.P.C. 20: 22.

Breaking stock treatment down into the following five phases: repulping, defibering, combination pulping and fibrillation, fibrillation, and cutting, the author discusses Black-Clawson machinery (Hydrapulpers, Hydrafiners, Hydrabeaters, etc.) for effecting the separate type of action required and combinations of machinery to produce the desired final result in correctly balanced proportions. The type of refining system which is best suited for a particular mill is first dependent upon the type of paper to be made and the type of pulp and raw products used in the furnish. The second consideration is the physical layout of the mill which in many cases dictates the form which a stock-preparation system finally takes. There are two basic types of systems, designated as batch and continuous; these can be further broken down into the following arrangements: batch horizontal, batch vertical (either Hydracycle or Duocycling), continuous, continuous recycling, and jordaning systems (gravity-inlet head box type, pressure-header system or loop type, and suction-couch jordan control). The layout of each of these systems is described. 24 figures. E.S.

STRAW

AYROUD, A., and JACQUEMIN, H. Orienting study on the rapid conversion of straw into pulp in a Dyno-Pulper. Assoc. tech. ind. papetière, Bull. no. 3: 84-92 (1954). [In French]

In a laboratory DynoPulper operated at 93°C. for periods of 7-60 minutes with 8-12% sodium hydroxide, wheat straw which had been pretreated with hot water was readily pulped. The best conditions entailed the use of 10-12% sodium hydroxide for 0.5 hour. With 12% sodium hydroxide nearly 42% of the original (15.6%) lignin and 26% of the initial (29.1%) pentosans were removed. By increasing the digestion to one hour, the hemicellulose losses barely changed, but 50% of the lignin was removed. Strength tests, given

in some detail, indicate that the pulp could be used satisfactorily in the manufacture of wrapping paper. Mill-scale studies are required before final conclusions can be drawn. The pulp yields under what are termed "identical conditions" varied from 68.7 to 80.1% (with an arithmetical mean of 73.4%). 3 tables, 17 figures, and 2 references. L.E.W.

STRAW—WASTE LIQUOR

ODRICH, G. The utilization of spent liquors from straw pulping. Wochbl. Papierfabrik. 82, no. 6: 185 (March 31, 1954). [In German] *cf.* B.I.P.C. 24: 744-5.

The author refers to his method (several patent applications pending) for fermenting, with the aid of butyl bacteria, the pentosans of spent liquors (I) from wood, straw, and other annual plants used in papermaking to butanol, acetone, etc. (*cf.* B.I.P.C. 23: 585). The lignin substances may be precipitated by pretreatment of (I) before fermentation. (I) are thereby freed from the principal organic constituents and may be safely discharged into even small ponding basins. E.S.

STREAM POLLUTION

DRUMMOND, R. M. Paper and pulp waste reduction by mill improvement. Sewage and Ind. Wastes 26, no. 5: 656-60 (May, 1954).

The author describes plant improvements in the Tonawanda, N.Y. mill of International Paper Co. since 1945, covering the closed mill system of the integrated paper mill making high-grade papers of the offset, book, tablet, coating raw stock, etc. types and a bleached soda pulp mill. New installations in the paper mill included new screens, equipment to take care of the tailings, new beaters, and a new saveall with twice the capacity of the previous units; the modernization in the pulp mill involved a new recovery unit, a two-stage brown stock washing system, a two-stage bleach plant, a new lime kiln and lime-mud filter, foam eliminators for the black-liquor tanks, and a concentrator for the black liquor. Unsightly froth formed as the wastes entered the river has been eliminated by the use of a foam killer. Appreciable savings in alkali, lime, fiber, and filler have been realized by these installations. Since no two paper and pulp mills are exactly alike, possible reductions in waste discharges will depend on age and type of mill, location, and the product being manufactured; careful planning, constant control, and modernization through the use of new equipment are essential for this purpose. 1 table. E.S.

HEUKELEKIAN, H., *and others.* 1953 literature review; a critical review of the literature of 1953 on sewage, waste treatment, and water pollution. Sewage and Ind. Wastes 26, no. 5: 573-615; no. 6: 695-744 (May, June, 1954); *cf.* B.I.P.C. 23: 828-9.

The first section of this annual review deals with analytical methods, sewage, and radioactivity; the second part covers industrial wastes (pulp and paper, p. 707-10) and water pollution (bacteriology, biology, chemistry, oxygen sag and self-purification, standards, surveys and studies, and abatement and control). 4 tables and 736 references. E.S.

RABELER, GORDON E. Pulp and paper mill industrial waste surveys. Tappi 37, no. 6: 144-6A (June, 1954).

The author describes the methods for conducting an industrial waste

survey in a pulp and paper mill in three phases: (1) the acquisition of a thorough knowledge of all mill operations, (2) the measurement of all mill wastes (establishing water and materials balances and determining the effect of the wastes on the receiving waters), and (3) the preparation of a comprehensive report. E.S.

WERNICKE, KONRAD. German water laws with special reference to impending legislation. Das Papier 8, no. 11/12: 218-20 (June, 1954); Wochbl. Papierfabrik. 82, no. 9: 316-17 (May 15, 1954). [In German]

The author discusses the industrial implications involved in three pending German water laws for the protection of groundwater, the decrease of river pollution, and improvements in the hygiene of water supplies and disposal of waste waters. 7 references. E.S.

SULFITE MILLS

ANON. Alaska Pine upgrades dissolving pulp; builds research center near Vancouver. Pulp & Paper 28, no. 5: 56-8, 60, 62 (May, 1954); *cf.* B.I.P.C. 24: 658.

The description of the Port Alice mill of Alaska Pine & Cellulose Ltd. on Vancouver Island, B.C. is similar to but much more abridged than that in the previous reference. 8 illustrations. R.A.S.

SULFITE WASTE LIQUOR

BRUNES, B. Developments in spent sulfite liquor. Svensk Papperstidn. 57, no. 9: 317-30 (May 15, 1954). [In Swedish; English and German summaries] *cf.* B.I.P.C. 22: 284.

Continuing his 1951 review, the author discusses recent developments in the recovery, evaporation, and combustion of calcium-base spent sulfite liquor (I). The collection of (I) from the blowpits is finding increased application; tests show that a high yield of dry substance without appreciable dilution of (I) may be obtained in this manner. The need for an instrument for measuring and recording the dry substance of (I) from each pit is pointed out, and the incrusting problem in a continuously operating displacement system of this type (which results in a liquor with a high calcium sulfate content) is mentioned. Practical experience indicates the suitability of vacuum and counter-pressure evaporators. Methods for combining the evaporation stage and the distillation to alcohol have been developed and are used on a commercial scale; the conventional alcohol plant for fermented (I) is replaced by equipment which is more reliable in operation and less space consuming. Evaporation by means of thermocompressors is discussed in some detail; this method will probably assume great importance in the future, particularly in plants with available low-cost electric power. The economics of the different evaporator systems are compared. With regard to the combustion of (I), the Loddby furnace and its operation are discussed, including methods for overcoming the fly-ash problem. A table listing the Swedish installations of this furnace with pertinent data is included. The results of numerous tests indicate that (I) can now be burned with a high combustion efficiency without use of additional fuel. 3 tables and 21 figures. E.S.

SULFITE WASTE LIQUOR—AMMONIA BASE

ANON. Chemical cover crop. Chem. Week 74, no. 24: 64 (June 12, 1954).

Orzan A (dried ammonia-base sulfite liquor, sold by Crown Zellerbach Corp. on a development basis for about $65/ton f.o.b. Lebanon, Ore.) is a coffee-colored, granular solid which is dissolved in water before application from a spray truck. Spread thinly over loose soil or sand, it binds the particles into a crust which lasts about six weeks under normal conditions. Its soil-stabilization characteristics are studied for combating wind erosion from farmland, binding sand on irrigation-canal banks or dunes surrounding farmland, and similar agricultural applications. 3 illustrations. E.S.

SYNTHETIC FIBERS

TEXTILE OR'GANON. World man-made fiber survey. Textile Or'ganon 25, no. 6: 81-96 (June, 1954); *cf.* B.I.P.C. 23: 920.

The annual survey of world production of synthetic fibers for 1953 and earlier years is presented. The 1953 output amounted to 4527 million pounds, 16% more than 1952 and slightly higher than 1951—a new record. Of this total, 4142 million pounds was rayon and acetate and 385 million pounds noncellulosic fiber; rayon production increased 18%, acetate 4%, and noncellulosic fiber 20%. Synthetic fiber comprised 19% of the total of cotton, wool, silk, and synthetic fibers compared with 17% of this total in 1952. The latest directory of synthetic fiber producers, according to countries, is included. 9 tables and 1 diagram. R.A.S.

TALL OIL

ANON. From byproduct to big product. Chem. Eng. 61, no. 6: 132, 134, 136 (June, 1954).

The greatly expanded use of tall oil and methods of refining it are reviewed. The most frequently applied procedures are acid refining (which aims primarily at the removal of objectionable impurities) and different modifications of fractional distillation (employed to separate rosins from the fatty acids). One producer uses solvent extraction of the fatty acids with propane on a commercial scale. Several successful laboratory methods mentioned include solvent extraction with naphtha or furfural, selective esterification, and thermal diffusion; these, however, have not yet been adapted to commercial installations. 1 flowsheet and 1 illustration. E.S.

ANON. Tall oils: plentiful and promising. Chem. Eng. 61, no. 6: 142, 144, 146 (June, 1954); Tappi 37, no. 7: 91-2A (July, 1954).

Tall oils have experienced rapid growth in just a few years, but their future promises even more room for expansion. Consumption, markets, price, availability, reasons for the demand, and applications are reviewed. 1 table. E.S.

VILBRANDT, FRANK C., *and others.* Tallol investigations. Bull. Virginia Polytech. Inst. Eng. Expt. Sta. Ser. no. 89: 14 p. (November, 1953).

In the Department of Chemical Engineering at the Virginia Polytechnic Institute investigations have been conducted since 1937 on the composition of crude and refined tall oil; methods of refining; esterification to produce plastics, resins, and drying oils; the synthesis of sebacic acid; the applications of tall oil in the manufacture of soap, grease, and road binders; and the corrosive effect of tall oil on metals. The present bulletin presents abstracts of the objectives, experimental procedures, and conclusions of each investigation up to 1947. 1 table and 27 references (26 of which are theses). E.S.

ULTRASONICS

ANON. Sperry develops inspection instrument to cut down time on paper machines. Paper Mill News 77, no. 24: 114 (June 12, 1954).

The ultrasonic inspection of the physical condition of essential parts of paper-mill machinery without disassembly or prolonged stoppage with a Sperry portable reflectoscope is described. The instrument involves a piezo-electric search unit which beams electrical pulses into metal parts which are transformed into ultrasonic vibrations. These sound waves converted into light waves by a cathode ray tube appear on a screen as pips. Defects are located and identified by the position and nature of the pips they create. 3 figures. E.S.

WASTE

MITTELSTEINER, ERICH. Pressure extraction of materials containing cellulose. Wochbl. Papierfabrik. 82, no. 9: 305-9 (May 15, 1954). [In German]

Details are given for the pressure extraction with alcohol at 130°C. and 8 atm. and 240° and 60 atm. pressure of the following raw materials: pine-wood, the woody tissue of grapevine, lignite, flax chaff, beechwood branches, and lignin residues from wood hydrolysis. In all cases resinlike products (I) termed crude waxes were formed, and at the lower temperatures, cellulosic fibrous materials were also isolated. At the higher extraction temperatures widespread decomposition occurred. The percentage of (I) increased, and the residues were termed "ligninwood" (II). Appreciable amounts of (I) were water soluble and apparently contained (unidentified) fatty acids. (I) also contained essential oils. (II) depending on its origin contained 1-5% ash, 0.06-1.2% sulfur, 58-66% carbon, and 5.3-5.9% hydrogen and had a calorific value ranging from 5300-6250 heat units. (I) are soluble in alkaline solutions and in alcohol, but insoluble in ethyl ether, petroleum solvents, and benzene. Plastics derived from (I) are discussed briefly and the industrial possibilities of (I) and (II) are outlined. 2 tables, 1 flowsheet, 1 diagram, and 3 references. L.E.W.

WATER AND WATER TREATMENT

PAPER-MAKER (LONDON). Knowledge and its enlargement. Water filtration for papermaking. Paper-Maker (London) 127, no. 5: 364-6, 368 (May, 1954); *cf.* B.I.P.C. 24: 805.

The principles of water filtration as far as papermaking is concerned are outlined. A typical water-treatment plant with flocculation and sedimentation tanks, gravity-type filter beds, and chlorination of either raw or filtered water is described; other types of plants may be radically different in design, but the principles on which they are built are generally very similar to those mentioned above. 1 flowsheet and 3 illustrations. E.S.

PULSOMETER ENGINEERING COMPANY, LTD., *Reading, England.* Treatment of polluted water. Paper Making 73, no. 1: 16 (Spring, 1954); *cf.* B.I.P.C. 23: 757.

A description of the Ionomatic process for treating polluted water, very similar to that given in the previous reference, is presented. 1 illustration. E.S.

WAXES

ANON. Modern paper conversion with the aid of waxes. Verpackungs Rundschau no. 5: 225-7 (May, 1954); Allgem. Papier-Rundschau no. 9: 470-3 (May 5, 1954). [In German]

The characteristics, differences, and possibilities for applications of paraffin and microcrystalline waxes in paper and board conversion are reviewed. 1 reference. E.S.

ANON. Waxes in the paper-converting industry. Neue Verpackung 7, no. 5: 238-40 (May, 1954). [In German]

Suitable waxes for coating, laminating, and heat sealing different types of paper and board for different applications are reviewed. 1 table. E.S.

WOOD

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. Commodity report; pulpwood and pitprop supplies. Unasylva 7, no. 4: 170-3 (December, 1953); *cf.* B.I.P.C. 23: 190.

The volume of output and the trade in pulpwood and pitprops in the course of 1950, 1951, and 1952 fluctuated considerably. The rising demand for increasing supplies of pulpwood in the pulp industries and for pitprops by coal producers created a heavy demand and high prices in 1951; in 1952, as the demand declined, the situation returned to a satisfactory normal. The total world production of pulpwood in 1952 was 144.7 million cu.m., a slight decline from 1951's all-time high of 148.7 million cu.m. The world production of pitprops in 1952 reached 38.7 million cu.m., an increase over the 37.3 million cu.m. set in 1951. The regional distribution of world production in these two categories is given in tabular form; other statistics are presented on European exports and imports of both products, production and consumption of pulpwood in the United States and Canada, and average or approximate pulpwood and pitprop prices for 1948-1953. 8 tables. R.A.S.

HALL, J. A. New uses for wood. Lake States Timber Dig. 7, no. 12: 3, 13 (May, 1954); *cf.* B.I.P.C. 24: 565.

The author reviews significant developments in wood utilization and emphasizes the economic importance to the forest industries of combination products of lumber, veneer, paper, and glue. R.A.S.

WOOD—MENSURATION

MCSWINEY, J. W. Weight scaling proves best for both mill and producer. Pulp & Paper 28, no. 6: 61-2 (June, 1954).

The benefits derived from a program of weight scaling truckload shipments of pulpwood are outlined. The functions of any wood-scaling program are a measurement for payment and inspection for cull wood that does not meet specifications. Weight scaling offers an incentive to the producer that divides the advantage fairly between producer and mill; it is expected that weight scaling can be expanded to include rail rack-car shipments. R.A.S.

WOOD OPERATIONS

MERRILL, J. H. Today's challenge to woods operators. Pulp Paper Mag. Can. 55, no. 6: 167, 169-70, 172 (May, 1954).

The change in the economic position of forestry in Canada, a change to

a high-cost operation at an economic disadvantage with competitors, must be met by a change in forest operations with the aim of reducing costs. Forest operations must be stabilized and become of a less seasonal character, buildings and other improvements must have a more permanent character, and better trained workers with a potential for increased productivity must be developed. R.A.S.

WOOD TRANSPORTATION

ANON. Finnish flow developer aids in loading jackladder, combats freezing. Pulp Paper Mag. Can. 55, no. 6: 214 (May, 1954); *cf.* B.I.P.C. 24: 580.

The construction of the Valmet flow developer for floating timber through still waters or similar bottlenecks where the sluggish or adverse flow of water delays the progress of work is described. The machine is available in four sizes and handled in Canada by Fennia Limited, Montreal, Que. 1 illustration. E.S.

YEAST

SCHMIDT, ERWIN. Food and feed yeast in Germany. Unasylva 7, no. 4: 152-4 (December, 1953).

The method used by the chemical pulp industry in Germany today for the continuous growing of *Torula utilis* according to the Waldhof process is described. The spent sulfite liquor principally used in yeast production is spent beech liquor; on the spent liquor of each short ton of beech pulp produced, 200 to 240 pounds of yeast can be grown. The food value of the yeast and its use in feeding livestock are discussed. 3 tables. R.A.S.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record, *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. Printed copies of Canadian patents are available at 50 cents per copy. Beginning with volume 21, the Canadian patents are abstracted from the complete specifications.

ABRASIVES

KUZMICK, JOSEPH N., and HILTON, LAMAR S. Manufacture of felted-fiber reinforced abrasive products. U. S. patent 2,673,146. Filed May 9, 1950. Issued March 23, 1954. 6 claims. Assigned to Raybestos-Manhattan, Inc. [Cl. 51-299]

A method of manufacturing abrasive wheels (I) is claimed in which the abrasive compound is added to a mixture comprising bentonite clay and a fibrous material (cotton flock, alpha flock, etc.) and then a resinous or rubber binder. The type of binding material added is dependent upon the characteristics required of (I). The composition is cast in the form desired in the finished product, thereby eliminating loss of material in the final shaping process. W.B.W.

ADHESIVES

ERIKSON, CARL R. Adhesive composition for metal foil to paper laminating. Canadian patent 502,547. Filed Dec. 14, 1950. Issued May 18, 1954. 3 claims. Assigned to The Arabol Mf'g Co.

An adhesive composition is composed principally of polyvinyl acetate resin and is adapted for the lamination of metal foil to paper. This is the same as U. S. patent 2,544,146 (March 6, 1951); *cf.* B.I.P.C. 21: 593. W.B.W.

WILKINSON, JOSEPH M., JR., and BARKER, JOHN P. Copolymers of 1-acyloxy-3-buten-2-one. U. S. patent 2,665,267. Filed Dec. 20, 1950. Issued Jan. 5, 1954. 6 claims. Assigned to General Aniline & Film Corporation. [Cl. 260-63]

A polymeric composition useful in pressure-sensitive adhesives, laminates, and paper fillers is produced by the reaction of acetoxymethyl vinyl ketone, isobutyl vinyl ether, and lauroyl peroxide (Alperox C) to produce a copolymer. Proportions of the materials may be varied widely depending upon the characteristics desired in the final product. W.B.W.

ALKALINE PROCESSES—RECOVERY

HOCHMUTH, FRANK W. Filter screen for heavy liquors. Canadian patent 502,585. Filed May 1, 1948. Issued May 18, 1954. 4 claims. Assigned to Combustion Engineering, Inc.

Concentrated black liquor from the evaporator is screened in this device before spraying into the recovery furnace. A perforated rotatable screen operates in a well of liquor, the bottom of the screen opening into the conduit for accepted liquor. Lumps are removed from the screen by a scraper, and steam is introduced into the bottom of the chamber where the lumps collect to soften and eventually dissolve. 2 figures. W.B.W.

BARKERS AND BARKING

CLARK, JAMES R., and ADAMS, SPENCER M., SR. Bark removing apparatus. Canadian patent 501,961. Filed Aug. 28, 1951. Issued May 4, 1954. 11 claims.

A cylindrical cage structure contains a rotor with radial arms which define compartments within the cylinder. Logs are placed in the several compartments and, upon rotation of the rotor, are thrown against the cage and each other to produce the necessary abrading action. This is the same as U. S. patent 2,599,090 (June 3, 1952); *cf.* B.I.P.C. 22: 867. 3 figures. W.B.W.

SHAW, ERNEST C., and HAGMAIER, WILLIAM G. Log barker and cleaner. Canadian patent 502,205. Filed Oct. 25, 1947. Issued May 11, 1954. 4 claims. Assigned to Allis-Chalmers Manufacturing Company.

In this barker, logs are supported and advanced past hydraulic nozzles by resting in the trough between two log-supporting rolls. One of these rolls has a fluted surface, and the surface of the other is threaded so that the combined action of the rolls is to rotate and advance the log simultaneously through the machine. Rotating brushes are located on either side of the point where the jets impinge on the log to aid in removal of embedded dirt which cannot be removed by hydraulic action alone. This is very similar to U. S. patent 2,338,136 (Jan. 4, 1944). 11 figures. W.B.W.

SHAW, ERNEST C., and HAGMAIER, WILLIAM G. Log barker and cleaner. Canadian patent 502,219. Filed Dec. 27, 1951. Issued May 11, 1954. 6 claims. Assigned to Allis-Chalmers Manufacturing Company.

This is very similar to U. S. patent 2,338,136 (Jan. 4, 1944) and Canadian patent 502,205 (May 11, 1954); *cf.* abstract above. 11 figures. W.B.W.

BLEACHING

ARMSTRONG, THOMAS J., and ILER, RALPH K. Process of preparing a hydrogen peroxide bleach. U. S. patent 2,679,483. Filed Oct. 26, 1951. Issued May 25, 1954. 1 claim. Assigned to E. I. du Pont de Nemours & Company. [Cl. 252-186]

Sodium silicate which is uniformly effective in peroxide bleaching solutions is produced by mixing sodium silicate with a 50% solution of sodium hydroxide to produce a ratio of silicon dioxide to sodium oxide from 2.25: 1

to 3.75:1 and containing at least 5% silicon dioxide. The amount of water is limited so that the temperature of the mixture rises to above 60°C.; the mixture is aged at least five minutes before diluting with water and mixing with the hydrogen peroxide. W.B.W.

BOARD, LAMINATED

GOSS, WORTH C. Method of pressing sheet lumber. U. S. reissue patent 23,829. Filed Feb. 6, 1953. Issued May 18, 1954. 11 claims. Assigned to The Sheetwood Products Company. [Cl. 18-47.5]

Lignocellulosic materials (i.e., wood chips, fibers, or wood-waste materials) and a bonding agent are formed in a pad and pressed between heated platens to form a dense layer on either surface of the sheet with a center body portion of less density. The bonding agent claimed in this reissue of U. S. patent 2,542,025 (Feb. 20, 1951; *cf.* B.I.P.C. 21: 505) is made from wet-ground brown rotted wood which contains lignin material soluble in dilute alkali solutions. 4 figures. W.B.W.

KREYLING, ROBERT L. Manufacture of combined paper board and silicate-clay adhesives therefor. Canadian patent 502,952. Filed Aug. 6, 1947. Issued May 25, 1954. 2 claims. Assigned to National Silicates Limited.

A clay-silicate adhesive suitable for use in the manufacture of solid containerboard, corrugated board, wallboard, and the like passes through a minimum viscosity of 0.5-5 poises at operating temperatures of 50-85°C., which rises with increasing temperature after passing the minimum. A flash set is produced upon application to a surface heated above said minimum. This is the same as U. S. patent 2,554,035 (May 22, 1951); *cf.* B.I.P.C. 21: 813. 5 figures. W.B.W.

BOARD SPECIALTIES

EBERT, LUDWIG. Rearwardly slanting collapsible cardboard floor stand. U. S. patent 2,677,469. Filed Dec. 9, 1950. Issued May 4, 1954. 2 claims. Assigned to Einson-Freeman Co., Inc. [Cl. 211-73]

A collapsible floor display stand formed of cardboard or corrugated board and intended to support packages or cans is substantially a rectangular tray supported in a slanting position by two extra panels which fold back from the sides of the tray. Two separate pieces reinforce the inside and outside of the bottom corner of the tray. 9 figures. R.A.S.

KING, GLENGARRY D. Bag and handle. Canadian patent 503,357. Filed Sept. 8, 1953. Issued May 25, 1954. 3 claims.

This corresponds to U. S. patent 2,661,892 (Dec. 8, 1953); *cf.* B.I.P.C. 24: 492. 4 figures. R.A.S.

TOENSMEIER, PATRICK A. Carton for like articles. U. S. patent 2,678,767. Filed Oct. 24, 1950. Issued May 18, 1954. 7 claims. Assigned to The Bartgis Brothers Company. [Cl. 229-40]

An open-end sleeve for holding a row of three cans secures them in place by means of flaps which fold inwardly and interlock with notches at the sides of a cutout portion of the sleeve which outlines the chimes of the two outer cans. 8 figures. R.A.S.

VANDER LUGT, THOMAS, JR. Collapsible carton member. U. S. patent 2,678,152. Filed Dec. 8, 1951. Issued May 11, 1954. 2 claims. Assigned to Sutherland Paper Company. [Cl. 229-35]

An easily collapsible open-top paperboard tray is claimed with double triangular corners cut shorter than and folded along the outside of the sides. These sides have short locking tabs at the top of each end cut to extend past the end walls. 5 figures. R.A.S.

VERGOBBI, ROBERT W. Reinforced bag. U. S. patent 2,678,768. Filed April 14, 1950. Issued May 18, 1954. 1 claim. Assigned to Pneumatic Scale Corporation, Limited. [Cl. 229-55]

A baglike container, preferably of a flexible transparent material, is reinforced at the bottom and rendered self-supporting in an upright position by the insertion of a bottom panel of substantially stiffer material, such as carton board, with two or four short side flaps forming square or rounded corners, or with two side panels in the shape of an inverted T for added support. 7 figures. R.A.S.

WAUDA, GEORGE E. Interfitting lock for containers. U. S. patent 2,677,493. Filed March 14, 1949. Issued May 4, 1954. 1 claim. Assigned to Marathon Corporation. [Cl. 229-35]

An open-top paperboard tray is secured in erected position by short notched extensions on the end walls which interlock with slits in the side walls. 12 figures. R.A.S.

CHLORINE DIOXIDE

STONE, WILLIAM A. Stable liquid chlorine dioxide composition. U. S. patent 2,678,922. Filed Dec. 28, 1951. Issued May 18, 1954. 4 claims. Assigned to Mathieson Chemical Corporation. [Cl. 252-187]

A mixture of liquid chlorine dioxide and liquid chlorine in proportions by weight not exceeding one part of chlorine dioxide for each two parts of chlorine is claimed to be stable and free from danger of explosion. The introduction of this mixture into an aqueous solution minimizes the danger and special precautions are not necessary. W.B.W.

DRYING—PAPER

DUNGLER, JULIEN. Method of treating sheet material coated with gelatine. U. S. patent 2,590,850. Filed Jan. 14, 1950. Issued April 1, 1952. 1 claim. [Cl. 34-23]

Evaporation of water or solvent from a paper or other web after treatment is accomplished in a chamber fitted with a series of elongated nozzles closely adjacent the sheet on both sides. Heated air or steam is forced through these nozzles with sufficient pressure to raise the temperature of the sheet above the boiling point, thereby causing rapid evaporation of the fluid. The web is guided between the nozzles by porous or perforated conveyor belts which offer little resistance to the passage of fluids. 2 figures. W.B.W.

DYES AND DYEING

GRAENACHER, CHARLES, and ACKERMANN, FRANZ. Process for improving fibrous materials. Canadian patent 503,068. Filed March

6, 1945. Issued May 25, 1954. 5 claims. Assigned to Ciba Limited.

An optical brightening agent which may be used with cellulose materials such as paper or textiles or with synthetic polyamide fibers is obtained by the condensation of a 2-methyl-benzimidazole with an aromatic aldehyde (i.e., fumaric acid and *o*-phenylenediamine). These compounds have a blue to violet fluorescence in daylight or under ultraviolet light but do not impart color to the material. W.B.W.

HOLTZMAN, HARRIS, and SIMON, ERIC. Process for preparation of chlorinated copper phthalocyanine. U. S. patent 2,662,085. Filed June 29, 1950. Issued Dec. 8, 1953. 11 claims. Assigned to Ansbacher-Siegle Corporation. [Cl. 260-314.5]

The production of chlorinated copper phthalocyanine used for coloring paints, inks, and paper is accomplished at temperatures in the range of 25-110°C. by dissolving the copper phthalocyanine in chlorosulfonic acid and bubbling chlorine through the solution in the presence of chlorination catalysts. The amount of chlorine introduced controls the color with the yellowish-green shades produced by introduction of a large number of chlorine atoms. W.B.W.

WAIT, EDWARD B. Dyeing fibrous sheet material. U. S. patent 2,678,588. Filed Oct. 28, 1948. Issued May 18, 1954. 6 claims. Assigned to Masonite Corporation. [Cl. 92-39]

Hardboard made from lignocellulosic material is dyed by spraying the top surface of the formed pad with a dye in aqueous solution to which alum has been added. Subsequent pressing of the pad carries part of the dye downward toward the screen side of the board which is likewise uniformly dyed. Acid dyes, direct dyes, or mixtures of the two may be used in this process; however, no fixing agent is required with the direct dyes used alone. W.B.W.

FOAM

FRITZ, JAMES H. Anti-foaming agents. Canadian patent 502,951. Filed July 27, 1943. Issued May 25, 1954. 4 claims. Assigned to National Oil Products Co.

An antifoaming agent which may be added to pulp suspensions, fermentation masses, coating, or other aqueous stocks subject to foaming comprises an ester of a fatty acid (i.e., hydrogenated soybean oil or castor oil) and a mixture of ethylene glycol polymers together with an extender such as wax or insoluble metallic soaps. W.B.W.

FOLDING BOXES

ANDRIOT, LAWRENCE J., JR. Cordage package. U. S. patent 2,678,724. Filed March 30, 1953. Issued May 18, 1954. 2 claims. Assigned to Puritan Cordage Mills. [Cl. 206-56]

A paperboard carton for two wound sections of cordage such as clothesline comprises two parallel halves and is divided by a line of weakness in the continuous front wall and cover and a double central partition. The flap of the cover is cut to fit around the partition; side flaps and the cover are cut at two outer corners to allow a cord loop between the wound sections to extend outside and provide a convenient handle. If only a single hank is desired, the joining loop may be severed and the carton separated into two complete individual container units. 4 figures. R.A.S.

BRADLEY, HARRY. Cartons and like containers. Canadian patent 502,770. Filed Nov. 5, 1949. Issued May 18, 1954. 2 claims. Assigned to John Waddington Limited.

A carton for such articles as electric light bulbs comprises end portions which fold back into the carton to hold the large and small ends of the article. This is the same as U. S. patent 2,643,814 (June 30, 1953); *cf.* B.I.P.C. 23: 932. 4 figures. R.A.S.

BURGER, MARTIN. Egg carton. U. S. patent 2,677,491. Filed May 11, 1948. Issued May 4, 1954. 7 claims. Assigned to Shellmar Products Corporation. [Cl. 229-28]

A method of cutting slits in a zig-zag fashion in the construction of partitioned paperboard egg cartons with a double-center dividing panel is claimed to offer less resistance to the passage of the cross partitions, tending to urge them into proper alignment; the number of improperly aligned or damaged cartons when automatic setup machines are used is thereby reduced. 10 figures. R.A.S.

BUTTERY, KENNETH T. Automatic setup carton. U. S. patent 2,677,495. Filed May 11, 1953. Issued May 4, 1954. 4 claims. Assigned to Sutherland Paper Company. [Cl. 229-39]

A collapsible covered square carton of the automatic-erecting type is constructed with bottom members which automatically swing into erected position and interlock when the specially cut outer flaps meet, forming four right triangles with the inner flaps at the center of the bottom. 5 figures. R.A.S.

BUTTERY, KENNETH T. Collapsible automatic setup carton. U. S. patent 2,677,494. Filed Oct. 11, 1950. Issued May 4, 1954. 3 claims. Assigned to Sutherland Paper Company. [Cl. 229-39]

The bottom construction for a collapsible covered rectangular carton is claimed, which comprises a series of tabs and notches on the lengthwise flaps; with the application of pressure on opposite corners of the carton, the flaps interlock and the carton is erected. 6 figures. R.A.S.

BUTTERY, KENNETH T. Collapsible covered container or box. U. S. patent 2,678,153. Filed Feb. 6, 1952. Issued May 11, 1954. 3 claims. Assigned to Sutherland Paper Company. [Cl. 229-36]

An interlocking closure is provided on covered cartons of paperboard or other relatively light container stock by the addition of notched tongues on the cover flap which engage inverted T-shaped slits on the top edge of the front wall of the carton. 5 figures. R.A.S.

BUTTERY, KENNETH T. Covered box. U. S. patent 2,677,492. Filed July 17, 1950. Issued May 4, 1954. 4 claims. Assigned to Sutherland Paper Company. [Cl. 229-31]

A collapsible covered carton or box formed of container or boxboard stock, of the type with the rear wall serving as a hinge between the section consisting of the bottom and three sides and the cover with flaps telescoping these sides, has short flaps which fold inward along the three sides, interlock at the corners, and are secured with adhesive. 6 figures. R.A.S.

INSULATION AND INSULATING MATERIALS

FRASER, LEWIS H. D. Heat insulating materials and method of making. Canadian patent 502,677. Filed Oct. 8, 1948. Issued May 18, 1954. 13 claims. Assigned to Owens-Illinois Glass Company.

A molded insulating material suitable for high-temperature use (i.e., above 600°F.) is produced by forming a slurry containing asbestos fiber, lime, diatomaceous earth, and water thoroughly mixed to form a uniform suspension; the suspension is placed in metal molds and subjected to live saturated steam to bring the charge up to temperature and held there for 12 hours. The gel structure formed in the above treatment is dried by further heating to form a porous structure throughout the entire mass. The original molded shape is retained. 2 figures. W.B.W.

INTERIOR PACKING

DAVOUS, LEON. Packing means. Canadian patent 501,975. Filed Jan. 23, 1951. Issued May 4, 1954. 15 claims.

The interior packing for a corrugated container used for the shipping and storage of fragile and/or small-sized articles, such as eggs, fruit, bottles, etc., as well as methods of manufacture and apparatus, is claimed. Numerous designs (honeycomb, etc.) are outlined in a network of cross partitions defining the individual article to be packed; strips of double- or single-face corrugated cardboard are used. 36 figures. R.A.S.

MACHINERY—CALENDERS

SCHNUCK, CARL F., and JOHNSON, EMIL H. Calender and the like. U. S. patent 2,678,465. Filed Jan. 4, 1951. Issued May 18, 1954. 5 claims. Assigned to Farrel-Birmingham Company, Incorporated. [Cl. 18-2]

The pressure between co-operating calendering rolls used for the manufacture of plastic materials in sheet form is maintained by a piston member attached to the roll journal and operating within a hydraulic cylinder. Fluid pressure in the cylinder is increased until the desired calendering is accomplished; subsequent changes in size of parts because of heat of running will not alter the adjustment. 7 figures. W.B.W.

SPENCER, VIRGIL. Calender. U. S. patent 2,678,464. Filed June 13, 1950. Issued May 18, 1954. 1 claim. Assigned to Armstrong Cork Company. [Cl. 18-2]

Pressure against the journal of a calender roll is transmitted through a short rod with ball joints on either end fitted into sockets on the journal and the adjusting screw. This allows the journal sufficient freedom of movement to prevent binding of the shaft by the bearing even under severe conditions encountered in mills used in the manufacture of linoleum and the like. 4 figures. W.B.W.

MACHINERY—CONVERTING MACHINERY

EATON, JOSEPH K. Device for setting-up collapsible cardboard cartons. U. S. patent 2,678,590. Filed Nov. 25, 1949. Issued May 18, 1954. 3 claims. Assigned to Bloomer Bros. Company. [Cl. 93-53]

The machine claimed erects folded cardboard cartons by the advancement

of the carton along a conveyor. Each carton comes in contact with a series of wedge-shaped rollers, which start the setting-up procedure, after which a shoe completes the final erection. 6 figures. W.B.W.

FLEMING, WILLIAM M., and KLEIN, MORRIS. Machine for manufacture of rectangular containers. U. S. patent 2,678,591. Filed June 16, 1950. Issued May 18, 1954. 7 claims. Assigned to Eskimo Pie Corporation. [Cl. 93-55.1]

Rectangular paper containers such as milk cartons are assembled from a body blank supplied to the machine in a flattened tubular form and top and bottom closures which are glued into the erected body blank. The inside of the completed container may be waxed by means of a spray head which is inserted into the container by a cam-operated lever. The machine may be synchronized with the filling machine so that the containers are produced as needed. 20 figures. W.B.W.

HALL, WINFIELD E., JR., HALL, ROBERT E., and PERRIGUEY, FORREST B. Container, apparatus and method for making the same. U. S. patent 2,677,489. Filed Aug. 9, 1949. Issued May 4, 1954. 10 claims. Assigned to American Trust Company. [Cl. 229-4.5]

A cylindrical container is formed by the convolute winding of adhesive-bonded layers of paper about a mandrel, while a knife cuts all layers but the first near one end of the tube so the container may be easily opened. Flanged-end closures are attached by gluing, stapling, or other means. 5 figures. R.A.S.

PAGENDARM, EDWARD J. Method of and apparatus for assembling box blanks. Canadian patent 502,250. Filed May 31, 1948. Issued May 11, 1954. 13 claims. Assigned to Bemiss-Jason Company.

Box blanks with slits in the side walls and interlocking projections on the end-wall flaps are forced through a forming die by the plunger in the device claimed. The tongues engage the side-wall slits during passage through the die and the completed box is stripped from the plunger as it starts the return stroke upward through the die. 22 figures. W.B.W.

POTDEVIN, ADOLPH. Apparatus for forming a valve in a bag and applying a supplemental sleeve-forming sheet thereto. U. S. patent 2,677,319. Filed Sept. 23, 1950. Issued May 4, 1954. 22 claims. Assigned to Potdevin Machine Company. [Cl. 93-8]

Bag blanks with gusseted sides are spread at one corner and the blank is infolded at the same time. A supplemental sleeve sheet is folded and inserted and the bag blank and valve sleeve are folded together; the completed valve bag is then discharged from the machine. 38 figures. W.B.W.

TORUDD, ERIK, and ANDERSSON, NILS. Method and machine for manufacturing container covers or lids of paper. U. S. patent 2,677,318. Filed Jan. 22, 1951. Issued May 4, 1954. 6 claims. [Cl. 93-1.3]

The machine claimed manufactures covers for cylindical containers by cutting a section from a laminated paper tube, pressing the upper edge of

the section inwardly to form a rim, then positioning a pair of disks, one on either side of the formed rim, and adhesively securing the disks to the rim and to each other to form a laminated end structure in the cover. 21 figures. W.B.W.

WHITTON, EARNEST C. Box scoring device. U. S. patent 2,679,104. Filed July 17, 1953. Issued May 25, 1954. 3 claims. [Cl. 33-42]

An adjustable hand tool for scoring the walls of cartons at a point best suited to make the carton fit the contents without waste space is claimed. 8 figures. W.B.W.

WHYTLAW, GRAEME G. Apparatus for forming tubular articles. U. S. patent 2,679,195. Filed July 13, 1950. Issued May 25, 1954. 8 claims. Assigned to American Viscose Corporation. [Cl. 93-82]

A continuous web of paper, textile, or the like is formed into a tube with overlapped edges and a thread of thermosensitive material fed between the edges; heat and pressure are applied to form the bond. Vinyl resins, polyvinyl chloride, ethylcellulose, and similar materials are listed as suitable for the sealing material. 4 figures. W.B.W.

MACHINERY—CORRUGATING MACHINE

RULLO, GABRIEL N. Adhesive applicator for corrugating machine. Canadian patent 502,415. Filed Sept. 11, 1948. Issued May 11, 1954. 1 claim. Assigned to S&S Corrugated Paper Machinery Co., Inc.

The applicator roll and its associated glue pan are adjustable downward and away from the corrugating roll for accessibility in cleaning and threading. This corresponds to U. S. patent 2,589,966 (March 18, 1952); *cf.* B.I.P.C. *22*: 633. 2 figures. W.B.W.

MACHINERY—CYCLONE CLASSIFIERS

FRANGQUIST, GUSTAV H. Dust separator apparatus. Canadian patent 502,586. Filed April 19, 1949. Issued May 18, 1954. 1 claim. Assigned to Combustion Engineering, Inc.

The dust-removal efficiency of a cyclone-type separator is claimed to be improved by the introduction at the inlet of coarse particles of a size easily removed by the separator together with moisture (e.g., steam). These coarse grains constitute nuclei around which the extreme fines agglomerate for subsequent separation. 3 figures. W.B.W.

MACHINERY—DRYERS

OHLSON, PAUL E., and HODGE, EDWARD A. Jacketed steam drier. U. S. patent 2,677,899. Filed May 16, 1951. Issued May 11, 1954. 11 claims. Assigned to The Pusey & Jones Corporation. [Cl. 34-124]

A drier drum comprising a pair of closely spaced concentric cylinders is divided longitudinally into compartments, with each compartment provided with a steam inlet and a condensate-collecting vane which directs the condensate into the outlet. The space between the cylinders is in the order of ⅛ of an inch which aids in the scouring of condensate from the walls with an

increase in heat-transfer efficiency of about 25% over prior steam-jacketed driers operating at similar pressures. 5 figures. W.B.W.

OHLSON, PAUL E., and HODGE, EDWARD A. Steam heated drier. U. S. patent 2,677,898. Filed Jan. 16, 1950. Issued May 11, 1954. 18 claims. Assigned to The Pusey & Jones Corporation. [Cl. 34-124]

An annular space is formed between the inside of the drier-drum wall and a lightweight shell placed within the drum. Steam is introduced into this annular space and the condensate is collected at numerous points by vanes which direct the condensate into the interior of the shell. Deflector strips mounted on the inside of this shell lead the condensate to a central collecting trough where a scoop collects it for removal through the hollow trunion. 21 figures. W.B.W.

MACHINERY—FOLDING MACHINE

ENS, EMIL J. Method and apparatus for pleating blanks of laminated sheet material and preformed blanks of laminated sheet material. U. S. patent 2,677,993. Filed June 28, 1949. Issued May 11, 1954. 6 claims. Assigned to Magnus Harmonica Corporation. [Cl. 93-1]

A preformed laminated blank consisting of a relatively stiff paper or cardboard ply adhesively secured to a flexible ply such as a plastic film is scored to fold in pleats. These blanks are fed in proper alignment into the pleating machine so that the machine operates continuously from one blank to the next. 11 figures. W.B.W.

MACHINERY—HEAD BOX

GOUMENIOUK, GLEB I. Stock inlet for papermaking machines. U. S. patent 2,677,991. Filed Feb. 2, 1948. Issued May 11, 1954. 14 claims. Assigned to Powell River Company Limited. [Cl. 92-44]

The headbox and slice construction claimed are in the shape of an inverted U and comprise a deceleration chamber in which the stock is traveling upward past rectifying rolls to a still pond at the top of the headbox under an air chamber (normally operated at less than atmospheric pressure), then downward from the still pond in the acceleration chamber which terminates in a slice at the forming wire just above the breast roll. Ability to treat the several areas within the headbox as separate hydraulic systems is listed as one advantage of this design. 6 figures. W.B.W.

HORNBOSTEL, LLOYD. Stock distributor for papermaking machines. U. S. patent 2,677,992. Filed Feb. 5, 1949. Issued May 11, 1954. 7 claims. Assigned to Beloit Iron Works. [Cl. 92-44]

A cross-flow stock distributor for either Fourdrinier or cylinder machines is claimed in which the stock from the screens is introduced through a pair of conduits into chambers on either side of a baffle plate at the bottom of which a rectifier roll mixes the stock from the two chambers and eliminates eddy currents. A second rectifier roll may be placed in the chamber to mix the stock further before it enters the pond chamber. Several modifications of this device are covered using both open-topped and pressure headboxes. 7 figures. W.B.W.

MACHINERY—PACKAGING MACHINERY

CURRIE, GROVER C., DANS, BERNARD D., WILKENS, LOUIS F., and DUNN, MAURICE B. Machine for packaging cylindrical articles. U. S. patent 2,677,221. Filed Dec. 26, 1951. Issued May 4, 1954. 95 claims. Assigned to Dacam Corporation. [Cl. 53-34]

This completely automatic machine is supplied with carrier blanks in the flat form and cans to be placed in the carriers. The cans and the partially folded carriers are brought together and the carrier is wrapped around the cans and secured by stapling or other means. Filled carriers are moved by conveyor to a point where they are stacked in groups of a predetermined number, whereupon the group is moved as a unit into a shipping container. 54 figures. W.B.W.

FISCHER, PAUL E., and PAULSEN, NEAL I. Method and mechanism for folding carton flaps. U. S. patent 2,677,220. Filed Dec. 23, 1950. Issued May 4, 1954. 9 claims. Fischer's interest assigned to General Mills, Inc., and Paulsen's interest assigned to Reynolds Metals Company. [Cl. 53-17]

Cartons with side walls extending above the top of the carton to form closure panels made from carton material coated with thermoplastic adhesive are sealed by first folding and pressing the wall extensions between heated sealing elements, then folding the sealed flaps back over the carton top and again applying sufficient heat to allow relief of the stresses developed during the folding operation. A thin metal plate is inserted over the top of the carton before refolding and pressing to insulate the sealed carton from the heat and pressure. 18 figures. W.B.W.

FRATTINGER, PETER A. Bundle wrapping machine. U. S. patent 2,677,222. Filed June 28, 1950. Issued May 4, 1954. 6 claims. Assigned to Robert Auguste Durand. [Cl. 53-45]

A machine for wrapping large bundles such as stacked sheets of plywood incorporates a conveyor for feeding the plywood and upper and lower wrapping sheets of paper or the like. These sheets are wider and longer than the material to be wrapped to provide for overlap on the sides and ends. Folding bars on opposite sides of the conveying belts cause this overlap to be folded against the edges of the bundle where suitable fastening means (such as staples or adhesive) are used to complete the package. 14 figures. W.B.W.

HENSGEN, BERNARD T., and VANDEN BOSCH, JOHAN C. Packaging of products in slab form. Canadian patent 503,215. Filed May 12, 1950. Issued May 25, 1954. 16 claims. Assigned to Swift & Company.

A strip of parchment paper is interleaved in a zig-zag manner between slices of cheese or like material to prevent the material from coalescing after slicing and also to simplify retailing the product. The interleaving mechanism is attached to the slicing machine without interfering with its operation. 12 figures. W.B.W.

VOGT, CLARENCE W. Method for making bundles of enwrapments. U. S. patent 2,677,317. Filed July 2, 1949. Issued May 4, 1954. 4 claims. [Cl. 93-1]

A method of making chained enwrapments (e.g., sheets used in packaging rectangular blocks of butter, etc.) consists of detachably connecting the folded enwrapments near the fold lines by means of a readily peelable adhesive so that the bundle is held in compact form or by applying a tape across the fold lines to hold each item in the bundle. 19 figures. R.A.S.

MACHINERY—PASTING MACHINE

COAKLEY, LIGE. Bag closing and sealing machine. U. S. patent 2,677,924. Filed Oct. 25, 1951. Issued May 11, 1954. 13 claims. Assigned to Bemis Bro. Bag Co. [Cl. 53-148]

Large paper bags used for packaging items such as sugar in five- and ten-pound bags are advanced to the sealing station by conveyor where folding arms press half of the flap down, then move outwardly at the same time as the adhesive-applying belt is advanced into the bag top and coats a rim portion of the upstanding flap with adhesive. Folding arms continue to move outwardly until the top is folded down and ears are projecting on either side of the bag; these ears are adhesively coated on the upper side and folded over on top of the bag to complete the closure. 9 figures. W.B.W.

EHRENFRIED, JOHN F., and TRICHE, JUNIUS A., JR. Thermosealable package. U. S. patent 2,679,194. Filed March 10, 1952. Issued May 25, 1954. 7 claims. Assigned to The Goodyear Tire & Rubber Company. [Cl. 93-8]

In the production of bags from heat-sealable films where two side panels are edge-sealed on three edges, a slip sheet of heat-insulating material such as paper is used to keep the bags separated. 5 figures. W.B.W.

MACHINERY—SCREENS

CRAM, HERVEY G. Disk screen. U. S. patent 2,679,193. Filed Jan. 13, 1949. Issued May 25, 1954. 4 claims. Assigned to Combined Locks Paper Co. [Cl. 92-34] *cf.* B.I.P.C. 24: 806.

A casing is divided into two sections by a screen plate slightly conical or dish-shaped provided with runners on either side which have a wiping action across the screen plate to increase the efficiency. The unscreened pulp is directed against the dished side to have a retarding action on the flow of stock and to increase the screen capacity. A radial chamber is provided around the casing for collection of rejected material where white water is introduced to aid in the removal. This is an improvement over U. S. patent 2,480,119 (Aug. 30, 1949); *cf.* B.I.P.C. 20: 60. 15 figures. W.B.W.

MACHINERY—SHEET-FEEDING MECHANISM

BACKHOUSE, HEADLEY T., and TEBBS, GEORGE W. Sheet feeding apparatus. U. S. patent 2,677,542. Filed Nov. 9, 1949. Issued May 4, 1954. 9 claims. Tebbs's interest assigned to Backhouse. [Cl. 271-8]

Sheets of substantial stiffness fed onto a layboard by conveyor tapes are registered against the front lay by a pusher wheel which engages the rear edge of each sheet. In one form of the pusher wheel claimed, a friction clutch allows the wheel to apply a sustained push to the sheet. 8 figures. W.B.W.

OHRN, RUDOLPH E. Sheet feeding mechanism. U. S. patent

2,677,543. Filed June 8, 1950. Issued May 4, 1954. 2 claims. Assigned to Container Corporation of America. [Cl. 271-44]

Feed dogs on a rocking shaft ride under stacked blanks or sheets of relatively thick paperboard or the like and engage the rear edge of the sheet, moving it downward and forward. As the dogs reach the forward limit of travel, the main feed element mounted in a reciprocating frame engages the rear edge of the sheet and carries it forward to the next station in the machine. An adjustable plate at the forward edge of the stack allows the feeding of only a single sheet from the bottom of the stack with each movement of the feed elements. 5 figures. W.B.W.

MACHINERY—SLICE

HEYS, RALPH C. Slice mechanism for papermaking machines. U. S. patent 2,677,316. Filed June 19, 1950. Issued May 4, 1954. 11 claims. Assigned to Millspaugh Limited. [Cl. 92-44]

The slice mechanism claimed comprises a tapering channel with adjustable opening, an evening roll, and an inclined evening board. The plate which forms the upper side of the nozzle is hinged for adjustability and contains a leveling means and provision for removal of excess stock at the outer end. A continuous apron forms the underside of the nozzle and the evening channel to the point where the stock is delivered to the wire adjacent the breast roll. 8 figures. W.B.W.

MACHINERY—STRIPPING MACHINE

SCHNEIDER, DAVID W. Method of and means for automatically picking waste material from carton blanks and the like articles. U. S. patent 2,677,994. Filed Sept. 2, 1949. Issued May 11, 1954. 16 claims. Assigned to Miehle Printing Press and Manufacturing Company. [Cl. 93-58]

The drum for removing waste from die-cut sheets of carton blanks contains picking elements which are applied by a special positioning device to lock the elements in operative position on the mounting. A grooved cylinder opposes the drum and provides a recess for the spurs of the picking elements. The waste is stripped from the spurs by fingers which are adjustable across the width of the picking drum. 24 figures. W.B.W.

MOLDED PULP ARTICLES

CRANE, HAROLD S. Molded pulp carton. U. S. patent 2,677,490. Filed July 23, 1948. Issued May 4, 1954. 13 claims. Assigned to Shellmar Products Corporation. [Cl. 229-15]

A molded-pulp carton for eggs is constructed with the center section molded to receive a dozen eggs and two identical cover sections hinged on either side forming the upper portion of straight sides, molded corners, and interlocking halves of the flat top. Overlaps of the ends which are stapled together and tabs further secure the end seams. 9 figures. R.A.S.

PACKAGING

BONINI, JOHN H. Packaging device. U. S. patent 2,678,770. Filed Aug. 28, 1951. Issued May 18, 1954. 2 claims. Assigned to Marathon Corporation. [Cl. 229-87]

A paperboard package for two layers of sausages forms a rectangular open-end sleeve around the bottom layer; a strip cut from the center of the top of this sleeve is raised to cover about a third of the top layer and interlocks with a tab of the same width extending from the opposite side wall. Transparent overwrapping may be added if desired. 4 figures. R.A.S.

BRADY, CHARLES V., and OTTINGER, AUGUST F. Container. Canadian patent 502,558. Filed March 12, 1951. Issued May 18, 1954. 1 claim. Assigned to Bemis Bro. Bag Company.

A bag useful for the purposes for which stiff-sided containers are used is claimed, which comprises a paper bag and a stiffening insert of pasteboard or the like. The insert is a rectangular blank folded to hold the bag in the shape desired, e.g., the bag is divided lengthwise into two rectangular compartments; the lower end of the insert engages the bottom of the bag. 6 figures. R.A.S.

PACKAGING—OPENERS

MULLINIX, CHARLES D. Tear strip package and blank therefor. U. S. patent 2,679,349. Filed Sept. 30, 1948. Issued May 25, 1954. 6 claims. [Cl. 229-40]

A sealed perforated tear strip is incorporated in the laminated blank structure of a package for food products such as butter, frozen foods, etc. 10 figures. R.A.S.

PAPER—COATED

LEIGHTON, PHILIP S. Process of cast-coating paper. U. S. patent 2,678,890. Filed Jan. 22, 1951. Issued May 18, 1954. 3 claims. Assigned to S. D. Warren Company. [Cl. 117-64]

A mineral coating composition is applied to the web, and the web is brought into contact with the heated cast-coating drum at the nip where a pool of water is held between the casting drum and the co-operating roll. Water is supplied to and withdrawn from this nip at such rate that the pool is always free of suspended mineral coating composition. The coated web is held in contact with the drum until the coating is substantially dry; a glossy surface is produced. 1 figure. W.B.W.

POMPER, ANTHONY W., and WAECHTER, CHARLES J. Web coating apparatus. U. S. patent 2,679,231. Filed Sept. 7, 1951. Issued May 25, 1954. 22 claims. Assigned to John Waldron Corporation. [Cl. 118-63]

An air doctor for removal of excess coating material from a paper web is formed by metal plates adjustable for opening between the plates and fitted with a baffle attached just below the nozzle to direct air flow downward and away from the coated sheet. Build-up of the coating particles on the baffle or streaking of the web is eliminated by this construction. 8 figures. W.B.W.

WALDIE, WILLIAM A. Crystallizing coating composition. Canadian patent 502,655. Filed Sept. 30, 1946. Issued May 18, 1954. 9 claims. Assigned to Midland Chemical Corporation.

A decorative coating composition for metal, glass, wood, or paper which

dries to a wear-resistant film with a crystalline surface pattern is made by dissolving acetanilide and chlorinated rubber in a hydrocarbon solvent. W.B.W.

PAPER—COATED (WRINKLE COATING)

BEYNON, NATHAN T. Cellulose base wrinkle composition. Canadian patent 502,368. Filed Oct. 26, 1945. Issued May 11, 1954. 5 claims. Assigned to New Wrinkle, Inc.

A wrinkle coating composition which may be sprayed, spread, or rolled on paper, fabrics, leather, and similar materials and dried at temperatures from 130 to 180°F. uses a wrinkling oil (i.e., tung oil, blown linseed oil) which includes conjugated double bonds in its chemical structure and a cellulose derivative such as cellulose acetate, ethylcellulose, or nitrocellulose, the amount depending upon the texture or pattern desired. W.B.W.

BEYNON, NATHAN T. Wrinkle coating compositions, especially for coating flexible materials. Canadian patent 502,369. Filed Feb. 3, 1947. Issued May 11, 1954. 4 claims. Assigned to New Wrinkle, Inc.

A wrinkle-coating composition for paper, fabrics, leather, and similar materials which does not require high temperatures in the drying process uses a wrinkling oil (i.e., tung oil or blown linseed oil) which includes conjugated double bonds in its chemical structure and a synthetic rubber latex such as Neoprene or polyvinyl chloride latex. The initial drying step is carried out at 130°F. and the final drying at a temperature of 180° for from 30 to 60 minutes to produce satisfactory results. W.B.W.

PAPER SPECIALTIES

BORCHARDT, LESTER F., and FELT, CLARENCE E. Bag closure. U. S. patent 2,678,154. Filed Sept. 29, 1948. Issued May 11, 1954. 1 claim. Assigned to General Mills, Inc. [Cl. 229-62]

A closure for a square-bottomed paper bag is effected by finger mechanisms which spread the bag mouth to a flattened element above the center of the bag top. This portion is folded down and secured with adhesive to half of the bag top and extending down both sides; the extensions can be further tucked under and sealed. 11 figures. R.A.S.

DANA, HOMER J., and ALBROOK, RAYMOND L. Sheet for electrical inscription. U. S. patent 2,677,651. Filed Oct. 9, 1950. Issued May 4, 1954. 11 claims. Assigned to State College of Washington. [Cl. 204-2]

The base sheet (cloth or paper) for the recording unit of a facsimile transmission unit is made electrically conductive by impregnation with a colorless stable nitrate salt such as ammonium nitrate in a polyhydroxy alcohol. The sheet is next impregnated with a solution containing N,N'di-β-naphthyl-*p*-phenylenediamine or the like which will react with the nitrate compound when an electric current is passed through the sheet to produce a colored oxidation compound. Small amounts of metal from the stylus may or may not enter into the reaction and the color change. W.B.W.

DAVID, ANDREW M. Two-in-one bank deposit envelope. U. S.

patent 2,678,769. Filed April 2, 1951. Issued May 18, 1954. 1 claim. [Cl. 229-73]

A bank mailing envelope permits two successive mailings by providing two sets of gummed flaps. The deposit slip is torn off along scored lines, and the duplicate slip stamped and returned by reversing the original address with the return address, which is on the opposite side of the envelope. 5 figures. R.A.S.

JONES, HAROLD H. Washcloth, dishcloth, scouring cloth and the like. Canadian patent 502,355. Filed Dec. 24, 1948. Issued May 11, 1954. 5 claims. Assigned to Kalamazoo Vegetable Parchment Company.

A sheet of parchmentized crepe paper is treated with glycerin to increase its pliability. This is the same as U. S. patent 2,526,076 (Oct. 17, 1950); *cf.* B.I.P.C. 21: 215. 4 figures. W.B.W.

MAYNES, HAROLD H. Bag, composite material, and method of making. U. S. patent 2,677,496. Filed Sept. 22, 1950. Issued May 4, 1954. 3 claims. Assigned to Arkell Safety Bag Company. [Cl. 229-55]

A composite material for making bags comprises at least two layers of crinkled paper (kraft or other strong paper crinkled by the water-crepe method), an adhesive coating (asphalt containing rubber or other elastomer) applied to the inner side of one crinkled layer, and a web of glass fibers (with the fibers running in both machine and cross-machine directions) laminated in such a manner that the fibers are embedded in the adhesive coating and the uncoated crinkled layer forms air spaces. 3 figures. R.A.S.

MILTON, JOSEPHINE E. Catamenial pad. Canadian patent 503,367. Filed April 7, 1951. Issued May 25, 1954. 5 claims.

Assembled plies of absorbent paper are held in place by a single short line of stitching. This corresponds to U. S. patent 2,582,344 (Jan. 15, 1952); *cf.* B.I.P.C. 22: 466. 5 figures. W.B.W.

ROGERS, HOWARD G., and MCCUNE, WILLIAM J., JR. Photographic product. Canadian patent 502,381. Filed Oct. 20, 1948. Issued May 11, 1954. 8 claims. Assigned to Polaroid Corporation.

The image-carrying layer in this composite sheet construction is fitted with a mask of calendered condenser-tissue paper bonded to the baryta-coated paper by a layer of polyvinyl alcohol and the application of pressure. Edge-spacer strips of kraft paper or cellophane are then applied to the mask with a suitable pressure-sensitive adhesive. In the development of the positive print, the above construction provides sufficient space between the two layers for the introduction of a uniform thin layer of developing liquid and makes the image-carrying layer easily strippable from the backing sheet. 3 figures. W.B.W.

SHEPHERD, JAMES C. Manifolding checkbook. U. S. patent 2,678,223. Filed Oct. 15, 1951. Issued May 11, 1954. 4 claims. Assigned to Universal Business Forms, Inc. [Cl. 282-23]

A checkbook which facilitates account keeping is made up of stapled or otherwise joined sheets comprising a record sheet the same size as the check,

the check itself, and a paper-backed transfer sheet, connected at lines of weakness. The transfer sheet duplicates information usually recorded on check stubs onto the record sheet, and the rest of the record sheet is ruled for listing expenses. 7 figures. R.A.S.

SOFFA, ALBERT. Carry bag handle construction. U. S. patent 2,679,350. Filed March 7, 1950. Issued May 25, 1954. 2 claims. Assigned to Wolf Brothers, Inc. [Cl. 229-54]

A strong handle construction for flat paper carry bags which are provided with a finger cutout and a tongue from the closure flap fitting through it comprises rectangular reinforcing patches of a similar material attached by adhesive or other means to the top of the bag, short flaps on the top of the cutout, a plurality of horizontal score lines eliminating sharp bends which might tend to break or crack the bag material, and ears of the tongue which serve to lock the tongue in its folded position. 8 figures. R.A.S.

SOFFA, ALBERT. Carry bag handle construction. U. S. patent 2,679,351. Filed March 7, 1950. Issued May 25, 1954. 2 claims. Assigned to Wolf Brothers, Inc. [Cl. 229-54]

This is very similar to U. S. patent 2,679,350 (May 25, 1954); *cf.* abstract above. 8 figures. R.A.S.

WORTHEN, STEPHEN V. Paper planographic printing plate with stabilized hydrophilic coating. Canadian patent 503,002. Filed April 21, 1951. Issued May 25, 1954. 16 claims. Assigned to S. D. Warren Company.

A paper-base planographic printing plate is made by application of a coating containing mineral filler and a hydrophilic adhesive with a multivalent and a uni-univalent salt used to fill the interstices of the coated surface. This corresponds to U. S. patent 2,635,537 (April 21, 1953); *cf.* B.I.P.C. 23: 778. W.B.W.

PLASTICIZERS IN PAPER

MILLER, HENRY C., and ROTHROCK, HENRY S. Polymerization of acrolein. U. S. patent 2,657,192. Filed Jan. 25, 1951. Issued Oct. 27, 1953. 6 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 260-67]

Polymers which are useful as modifiers for papers, adhesives, textiles, films, etc. are produced by the polymerization of acrolein in the presence of basic catalysts. In one example, an acrolein-vinyl acetate copolymer is formed by mixing 950 parts of vinyl acetate, 200 parts of methanol, and 80 parts of a 25% solution of acetyl peroxide in dimethyl phthalate. The mixture is heated to reflux temperature under a nitrogen atmosphere, then 20 parts of a mixture of 50 parts acrolein and 50 parts methanol is incorporated, with the rest of the mixture added after an hour of refluxing; refluxing is continued for a total of 13 hours. The solvent is removed by distillation to leave a residue of solid colorless copolymer stable on storage and soluble in solvents for several months. W.B.W.

PLYWOOD

SOEHNER, HOWARD C. Method for producing plywood with a paper-faced platen. U. S. patent 2,660,548. Filed July 7, 1950.

Issued Nov. 24, 1953. 4 claims. Assigned to The Mengel Company. [Cl. 154-106]

In the production of plywood from wet veneer, the use of an absorbent layer of paper between the face sheet of the plywood and the platen is claimed to absorb secretions from the wood and aid in production of a panel with a clean face veneer free of blemishes. A fivepoint kraft paper has sufficient absorbency and strength to be well suited for this purpose; it can be readily stripped off the facing sheet. 2 figures. W.B.W.

PRINTING AND PRINTER'S INK

MURRAY, ALEXANDER. Photothermography and printing inks therefor. Canadian patent 502,022. Filed Feb. 16, 1948. Issued May 4, 1954. 7 claims. Assigned to Canadian Kodak Company, Ltd.

In the process claimed, an ink sheet is first formed by dispersal of a pigment in a suitable vehicle (e.g., benzophenone, methyl *O*-benzoylbenzoate) whose melting point lies in the range of 42-52°C., and the ink-vehicle mixture is cast upon a suitable surface. The ink sheet is then heated to a point just under the melting point of the vehicle and the surface exposed to infrared radiation through a two-tone negative to melt the sheet in the exposed areas. While the ink is still in the melted condition, paper is brought into contact with the ink sheet and pressure applied to transfer ink from the melted areas of the ink sheet to the paper. 15 figures. W.B.W.

RADIOACTIVITY

MORRIS, WILFORD E., and GEHMAN, SAMUEL D. Beta ray thickness gauge. Canadian patent 502,152. Filed Aug. 31, 1949. Issued May 4, 1954. 3 claims. Assigned to Wingfoot Corporation.

A noncontact gage for the measurement of film thicknesses up to 0.01 inch comprises a thermostatically controlled ionization chamber containing barium carbonate with radioactive carbon isotope C^{14} and a head comprising electrometer and amplifier tubes to measure the change in beta-ray absorption continuously. Static charges are removed from the film prior to passage between the source and the head by polonium plated nickel bars closely spaced on either side of the film. For maximum accuracy, the source of radiation should be chosen so that the average film thickness measured will absorb about 50% of the rays emitted. 6 figures. W.B.W.

SHIPPING CONTAINERS

FERGUSON, KENNETH C., and SCHAEFER, NORBERT F. Shipping container. U. S. patent 2,678,765. Filed June 9, 1950. Issued May 18, 1954. 1 claim. Assigned to Anderson Box Company. [Cl. 229-6]

A corrugated paperboard container particularly adapted for the shipment of baby chicks is constructed with the center of the side walls lower than the edges and with cover-supporting corner portions below the upper edges of all four walls. Two raised notches in a central partition extend through slots in the cover; perforated sides, partitions, and cover and cutouts at the top center of the walls provide ventilation. 7 figures. R.A.S.

TICHENOR, HAROLD D. Chick box. U. S. patent 2,679,348. Filed Jan. 21, 1949. Issued May 25, 1954. 2 claims. Assigned to Wabash Fibre Box Co. [Cl. 229-15]

A perforated cover which incorporates a slotted center fold and peripheral flanges is claimed for a corrugated-board chick box with side walls lower at the center than at the ends. A partition between the midpoints of the side walls has a notched ear section which fits through the slot and locks the cover in place. 9 figures. R.A.S.

SHIPPING CONTAINERS—FIBER DRUMS

BERGSTROM, HAROLD A. Heavy duty fiber drum for liquids and semi-liquids. Canadian patent 502,280. Filed Dec. 8, 1951. Issued May 11, 1954. 3 claims. Assigned to Continental Can Company, Inc.

A heavy-duty fiber drum especially adapted for storing and shipping liquids is made punctureproof by the incorporation of a ply of light-gage steel between inner and outer plies of fiberboard in the convolutely wound drum. The body wall and the flange of the metal tray in the bottom heading are rolled into a bead, providing a liquidtight closure. 4 figures. R.A.S.

SHIPPING CONTAINERS—MULTIWALL BAGS

KINDSETH, HAROLD V. Bag closure and apparatus for making the same. Canadian patent 502,557. Filed March 7, 1951. Issued May 18, 1954. 18 claims. Assigned to Bemis Bro. Bag Company.

The tops of multiwall paper bags containing comminuted materials are formed in a neat closure ready for stitching, adhesive application, or other closing means by several pairs of co-operating rolls which bring the walls together by successive stages as the bag is advanced on a conveyor. 9 figures. W.B.W.

TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

MCCARTHY, JAMES F. Water and flameproofing composition. Canadian patent 502,138. Filed March 18, 1947. Issued May 4, 1954. 1 claim. Assigned to Treesdale Laboratories, Inc.

A water- and flameproofing composition for the coating or impregnation of textiles or the like consists of an aqueous dispersion containing polyvinyl chloride, a plasticizing agent, antimony oxide, sodium carboxymethylcellulose, and ammonium hydroxide. This corresponds to U. S. patent 2,591,368 (April 1, 1952); *cf.* B.I.P.C. 22: 720. W.B.W.

NIELSEN, MORRIS L. Chemical process. U. S. patent 2,648,597. Filed March 24, 1951. Issued Aug. 11, 1953. 4 claims. Assigned to Monsanto Chemical Company. [Cl. 23-190]

A phosphorus-nitrogen condensation product useful for flameproofing fabrics, which is neutral or slightly alkaline so that it does not cause deterioration of the fibers in the fabric, is washed with acetic or similar acid to remove all acid solubles and to obtain the acid-insoluble portion as a material of improved fire-retardant properties. W.B.W.

WOOD, FIREPROOF

CUNNINGHAM, GEORGE L. Fire retardant coating composition. U. S. patent 2,679,489. Filed Feb. 3, 1953. Issued May 25, 1954. 10 claims. Assigned to Waterloo Corporation. [Cl. 260-15]

A tough, elastic, fire-retardant coating composition for wood or other combustible material which will produce a noncombustible, stable, foamlike structure under the influence of heat employs urea and formaldehyde as the resin-forming ingredients. Thickening agents such as methylcellulose or polyvinyl alcohol which are not salted out by the presence of ammonium phosphate or other salt are added to give the composition the desired viscosity. The presence of these agents likewise tends to retard the formation of the resin and the composition remains usable for 50-60 hours. W.B.W.

WOOD OPERATIONS

KENNEDY, GEORGE H., and MATHESON, CHESTER R. Logging units. Canadian patent 501,540. Filed Jan. 13, 1947. Issued April 20, 1954. 5 claims.

The unit claimed is a combination of yarding device, barker, chipper, and chip handling machinery. Logs are pulled to the unit by the lines of the yarding machinery, then barked and chipped, and the chips conveyed to trucks or other hauling means for transport to the mill. 4 figures. W.B.W.

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